

*Office of Environmental Management – Grand Junction*



## Moab UMTRA Project

# March 2008 Validation Data Package for Performance Assessment of the Monthly Sampling for the Ground Water Interim Action and for the Ground Water and Surface Water Interaction Investigation Sampling

December 2008



U.S. Department  
of Energy

## **Office of Environmental Management**

**March 2008 Water Sampling**

**Validation Data Package  
for Performance Assessment of  
the Monthly Sampling for the  
Ground Water Interim Action and for the  
Ground Water/Surface Water Interaction  
Investigation Sampling  
Moab, Utah**

**December 2008**

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## 1.0 Sampling Event Summaries

This validation data package (VDP) presents the results of two sampling events that occurred in March 2008. A monthly sampling event was completed from March 11 through 13, 2008, in which ground water samples were collected from a variety of locations across the well field. Between March 18 and 20, 2008, both ground water and surface water locations were sampled as part of the initial event associated with the surface water/ground water interaction investigation.

Section 1.0 contains the Summary Criteria with a sample location map (Section 1.1), Executive Summaries (Section 1.2), and the Sampling and Analyses (Section 1.3) for both March 2008 sampling events.

### 1.1 Summary Criteria

#### 1.1.1 Monthly Sampling Event

**Sampling Period:** March 11-13, 2008

The purpose of this sampling was to collect data that can be used to evaluate the performance of all configurations of the ground water Interim Action well field. All sampling locations are shown on Figure 1.

- 1. As a result of this sampling event, is there any indication of anomalous data that may be related to well field pump rate changes, river flow, or other known causes?**

No.

- 2. Were all Interim Action well-field pumps operating within the planned parameters?**

Yes. As scheduled, only Configuration 1 was actively extracting ground water during the time this sampling event was completed.

- 3. Was the evaporation pond functioning properly?**

Yes. The pond level was between 6.7 and 6.8 feet (ft) during this sampling event and in the process of slowly filling up as Configuration 1 continued pumping over the winter.

- 4. Were all proposed well (ground water) and surface-water locations sampled during this event?**

Yes.

- 5. Were there any site activities that have impacted or may impact the Interim Action system?**

No.

### *1.1.2 Ground Water/Surface Water Interaction Investigation Sampling Event*

**Sampling Period:** March 18-20, 2008

The purpose of this sampling was to collect data that represents the Colorado River base flow conditions that will ultimately be used as baseline data for a ground water/surface water interaction investigation. The investigation is designed to determine the vertical and lateral migration of fresh water from the river into saline groundwater in the vicinity of the well field. Additional sampling will be conducted later under anticipated higher than average river flows during the 2008 spring runoff. A series of surface water locations, well points, observation wells, and one extraction well from Configuration 1 and the Baseline areas were sampled at varying depths and distances from the river channel. All sampling locations are shown on Figure 1.

- 1. As a result of this sampling event, is there any indication of anomalous data that may be related to well field pump rate changes, river flow, or other known causes?**

No.

- 2. Were all Interim Action well-field pumps operating within the planned parameters?**

Yes. As scheduled, only Configuration 1 was actively extracting ground water during the time this sampling event was completed.

- 3. Was the evaporation pond functioning properly?**

Yes. The pond level was between 6.6 and 6.7 ft during this sampling event. The sprinkler system was restarted on March 20, 2008, and in the process the pond level started slightly decreasing.

- 4. Were all proposed well (ground water) and surface water locations sampled during this event?**

No. Well point 0494 was dry, and it was not possible to collect a sample from this location.

- 5. Were there any site activities that have impacted or may impact the Interim Action system?**

No.



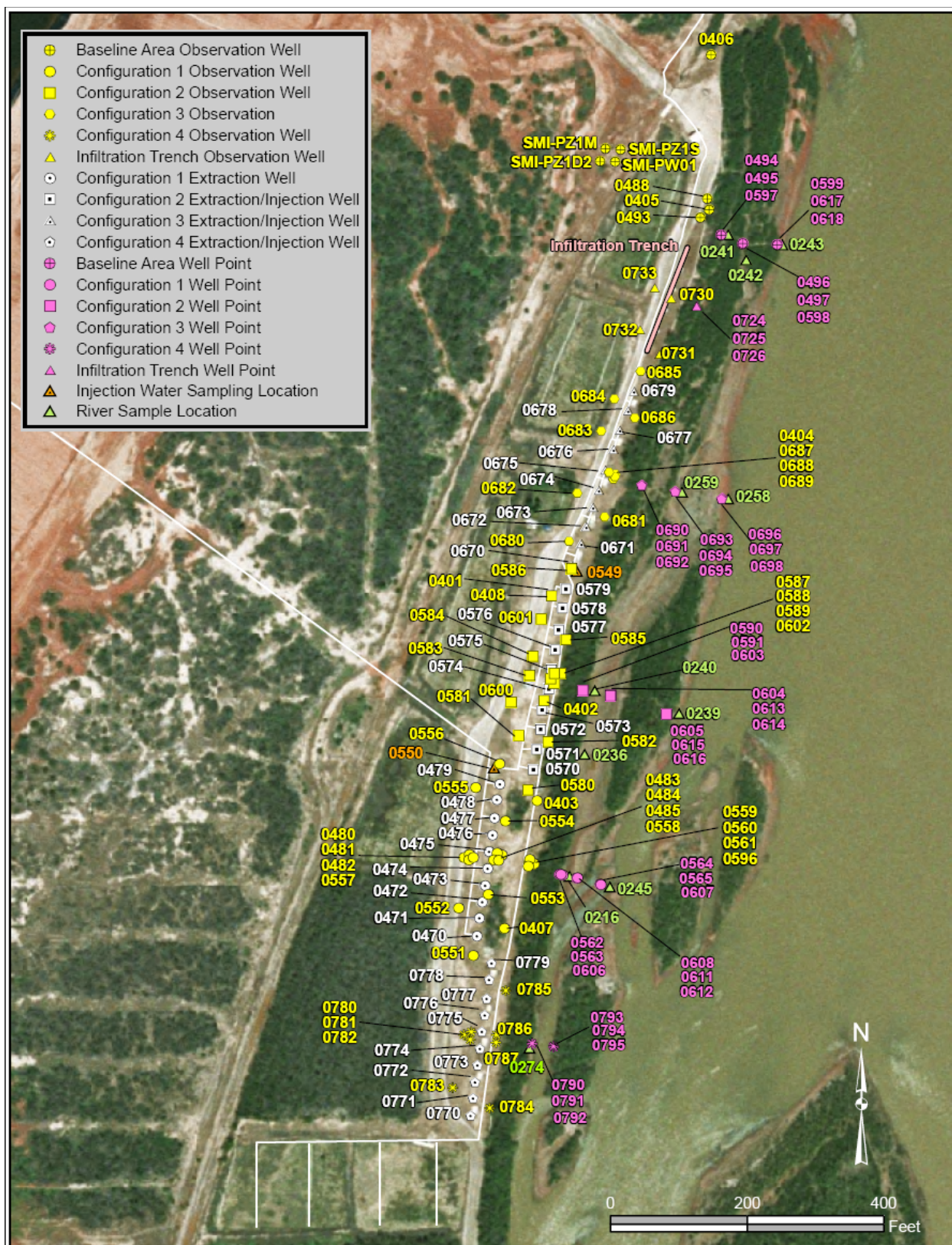


Figure 1. Sample Locations at the Interim Action Well Field and Baseline Area  
(may include locations not sampled)

## **1.2 Executive Summary**

### ***1.2.1 Monthly Sampling Event***

This validation data package (VDP) presents the validated data associated with the ground water collected during the March 2008 monthly sampling event at the former uranium tailings processing site in Moab, Utah. This VDP includes a discussion of the data validation process in Section 2.0 with a description of how these data are qualified based on field and laboratory verification assessments (Sections 2.1 and 2.2.1). Attachment 1 contains the Trip Report detailing the field events associated with this sampling event.

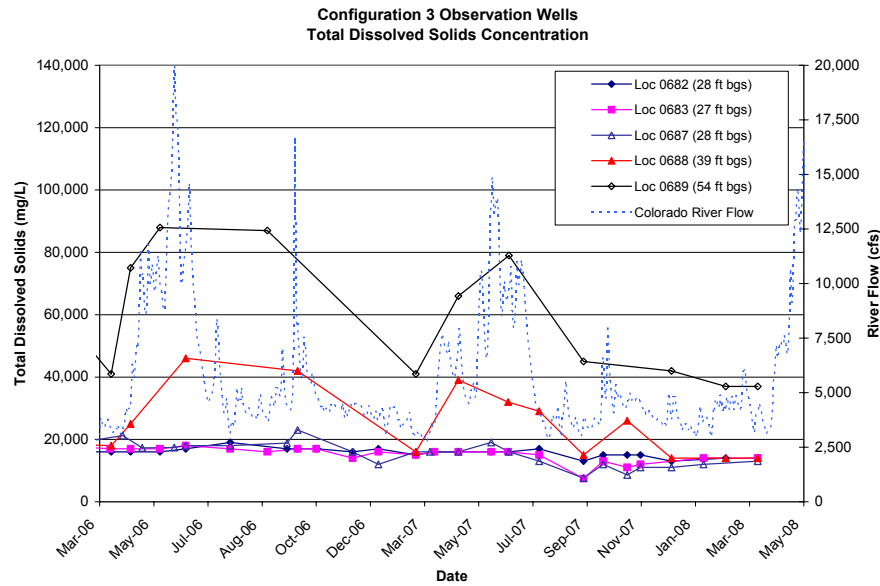
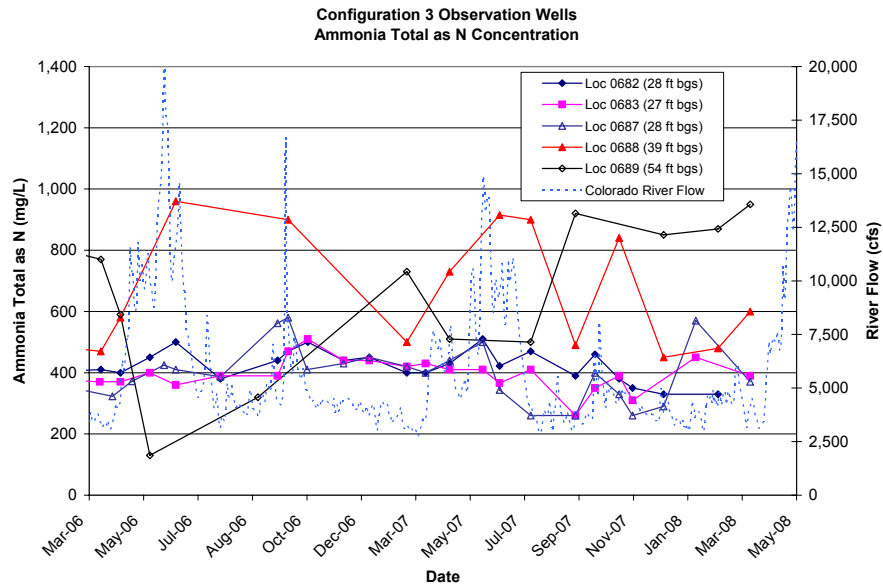
A list of flagged data is presented in Table 3 in Section 2.2.1. No data were rejected (flagged as “R”) as a result of this validation process. A Minimums and Maximums Report (presented in Section 3.1.1) was generated to determine if the data are within a normal statistical range. Any anomalous data, based on the results of the Minimums and Maximums Report, are presented in Section 3.2.

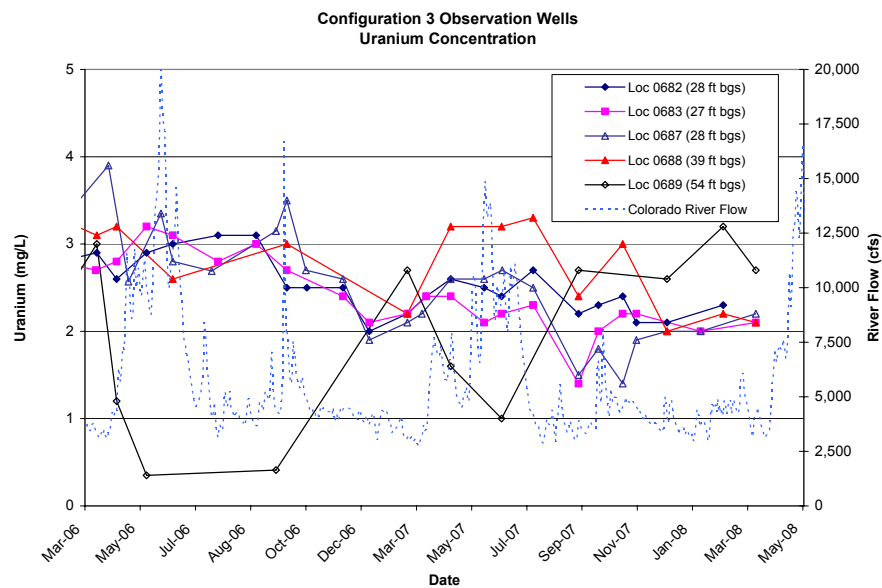
While independent of the data validation process, a brief summary of the most recent concentration trends based on the March 2008 data is provided for Configurations 3, 1, and 4 (listed from north to south) within the well field. Time versus concentration (ammonia, total dissolved solids [TDS], and uranium) plots for selected performance indicator monitoring wells located upgradient or downgradient within the Interim Action well field are presented to display historical trends exhibited by the data over the past 2 years. Colorado River flows over the same time frame are also plotted to determine whether the magnitude of river flows influences analyte concentrations.

#### **Configuration 3**

A review of the time versus concentration plots for Configuration 3 suggests analyte concentrations for samples collected from wells screened less than 30 ft below ground surface (bgs) have not fluctuated significantly; this trend is more pronounced for TDS and less so for ammonia and uranium. Analyte concentrations in samples collected from 39 ft bgs and below exhibit fluctuation in response to river flows.

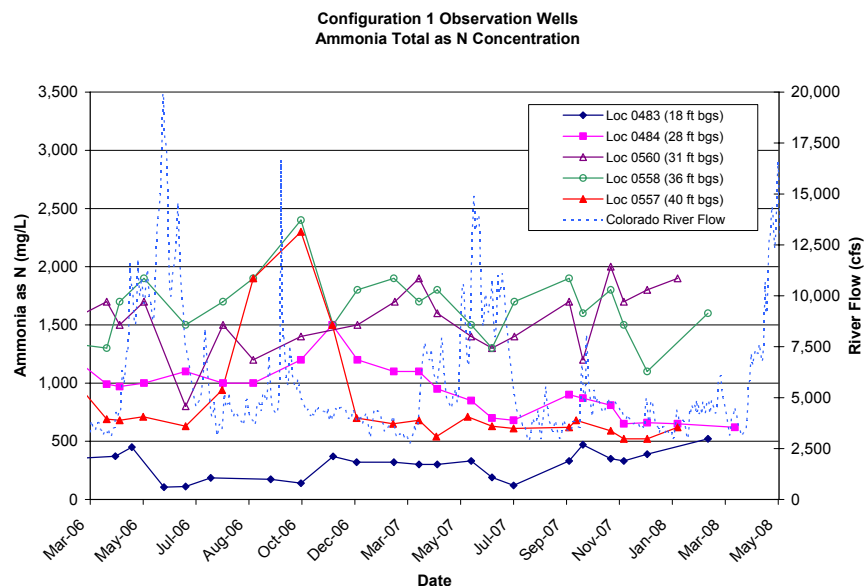


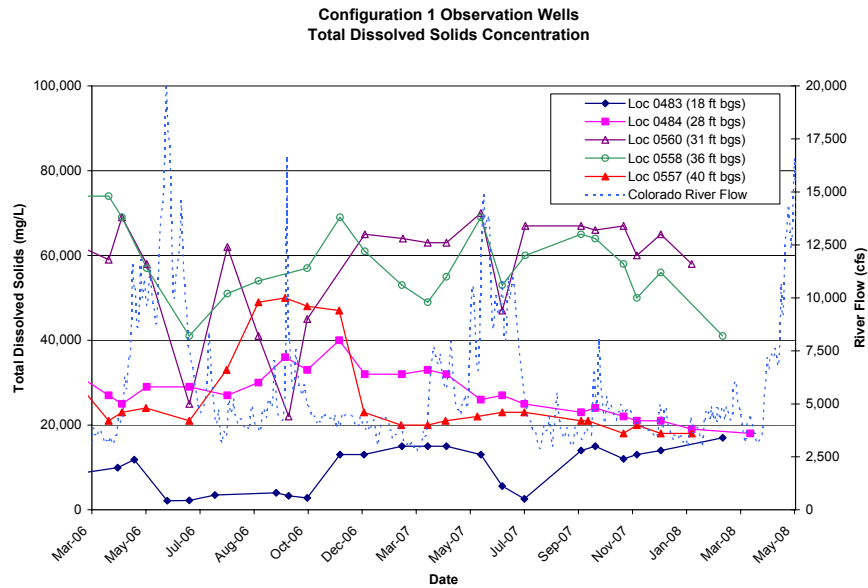




### Configuration 1

In general, analyte concentrations shown on time verses concentration plots for Configuration 1 observation wells were consistent with past sampling concentrations with two groupings: the medium-depth wells (0558 and 0560) were similar, and the shallow (0483 and 0484) and deep wells (0557) were similar. The medium-depth wells had higher TDS and ammonia than the shallow and deep wells. Uranium concentrations do not show this difference, and the concentrations in all wells appear to be continuing the trend of all becoming similar.

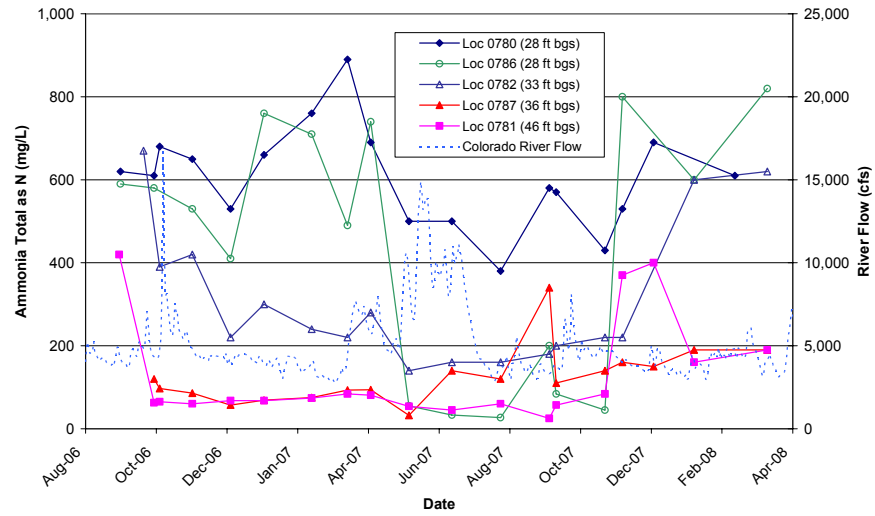




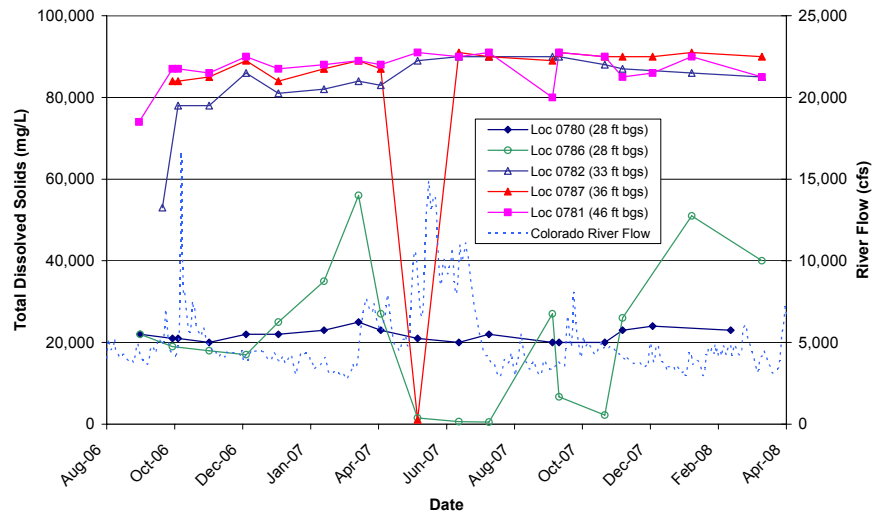
#### Configuration 4

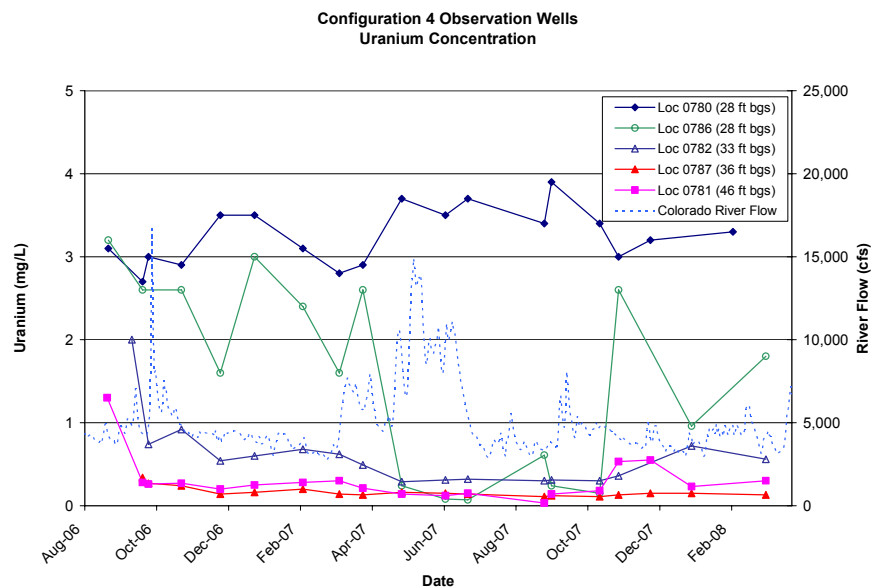
In Configuration 4, TDS and uranium in the deeper wells (greater than 30 ft bgs) are more stable with higher TDS and lower uranium than the shallower wells. Ammonia concentrations in samples collected from all wells continue fluctuating.

Configuration 4 Observation Wells  
Ammonia Total as N Concentration



Configuration 4 Observation Wells  
Total Dissolved Solids Concentration





## Surface Water Sampling Results

Surface water locations were not sampled as part of this sampling event.

### *1.2.2 Ground Water/Surface Water Interaction Investigation Sampling Event*

This VDP presents the validated data associated with the ground water and surface water samples collected during the March 2008 Interim Action Well Field Ground Water/Surface Water Interaction Investigation Sampling Event at the former uranium tailings processing site in Moab, Utah. This sampling event represents base flow conditions (i.e., baseline conditions) for this investigation. This VDP includes a discussion of the data validation process in Section 2.0 with a description of how these data are qualified based on field and laboratory verification assessments (Sections 2.1 and 2.2.2). Attachment 2 contains the Trip Report detailing the field events associated with this sampling event.

A list of flagged data is presented in Table 6 in Section 2.2.2. No data were rejected (flagged as “R”) as a result of this validation process. A Minimums and Maximums Report (presented in Section 3.1.2) was generated to determine if the data are within a normal statistical range. Any anomalous data, based on the results of the Minimums and Maximums Report, are presented in Section 3.2.

Typically time versus concentration (ammonia, TDS, and uranium) plots are provided in this section of the VDP. However, due to the fact that this VDP is associated with the first of a series of five special investigation sampling events, samples were collected at different depths compared to previous monthly sampling events. As a result, it was not possible to compare previous results to the data collected during this sampling event. Time versus concentration plots will be provided to exhibit contaminant concentration trends as more data are collected in the subsequent VDPs.

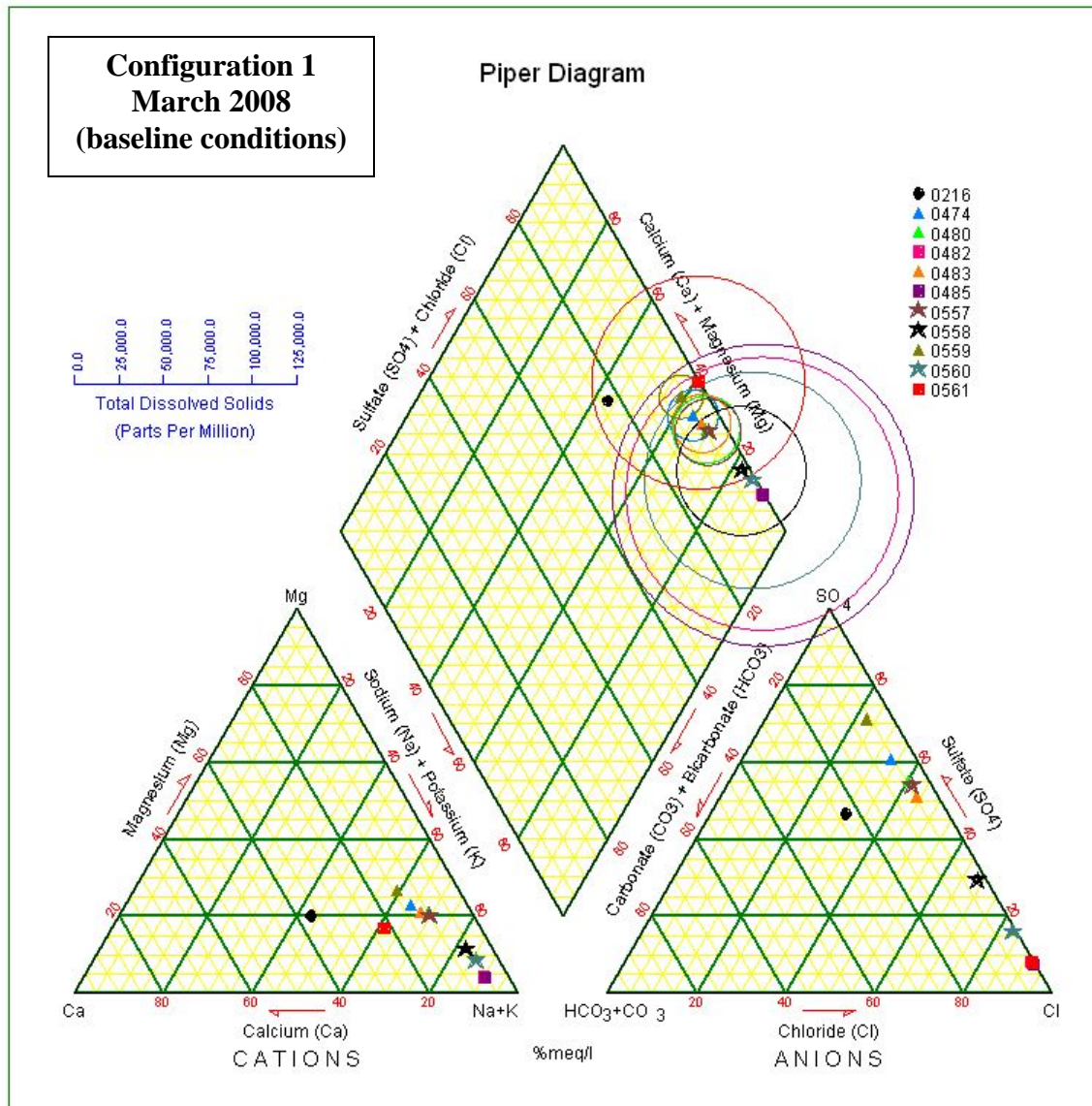


## Configuration 1

As expected, the trilinear diagram below generated using water chemistry data from the Configuration 1 locations exhibits how the surface water sample (0216) also is a mixed type with different ionic composition from the ground water samples. The surface water sample was collected from a riparian channel adjacent to the Colorado River. All ground water samples from the Configuration 1 area had the same dominant cation, sodium, but different dominant anions. Samples collected from the shallow depth (locations 0474, 0480, 0483, and 0559 were sampled from 18 ft bgs) and the upgradient intermediate depth (location 0557 from 36 ft bgs) are classified as sodium-sulfate-type water. The remaining intermediate zone samples (locations 0558 and 0560 were sampled from 36 ft bgs) and those collected from the deep zone (locations 0482, 0485, and 0561 from 55 ft bgs) are classified as sodium-chloride-type water, which is indicative of brine.

There is no difference in ionic chemistry between surface water samples collected off the Baseline Area in the Colorado River and the riparian channel off Configuration 1.





## Surface Water Sampling Results

Table 1 presents a summary of the ammonia concentrations associated with the surface water samples collected during this sampling event. For comparison purposes, the applicable State of Utah and federal criteria for both acute and chronic concentrations (along with the temperature and pH data used to calculate these concentrations) are provided.

Table 1. Surface Water Ammonia Concentrations and Comparisons to State of Utah and Federal Criteria

<b>Loc</b>	<b>Date</b>	<b>Temp (°C)</b>	<b>pH</b>	<b>Ammonia as N (mg/L)</b>	<b>State/Federal AWQC-Acute Total as N (mg/L)<sup>1</sup></b>	<b>State/Federal AWQC- Chronic Total as N (mg/L)<sup>2</sup></b>
0216	3/19/08	10.3	8.01	1.2	5.62	2.43
0243	3/19/08	14.9	8.3	0.36	3.15	1.52

Notes: Loc = Location, Temp = Temperature, AWQC = Ambient Water Quality Criteria

(1) State of Utah, Standards of Quality for Waters of the State (Effective May 1, 2008), Rule R317-2, Table 2.14.2, 1-Hour Average (Acute) Concentration of Total Ammonia as N (mg/L)

(2) State of Utah, Standards of Quality for Waters of the State (Effective May 1, 2008), Rule R317-2, Table 2.14.2, 30-Day Average (Chronic) Concentration of Total Ammonia as N (mg/L), Fish Early Life Stages Present

As shown in Table 1, neither of the two surface water samples collected during this sampling event exceeded the state or federal acute or chronic criteria.

## 1.3 Sampling and Analyses

### 1.3.1 Monthly Sampling Event

Sampling and analyses were conducted in accordance with the *Operations, Maintenance, and Performance Monitoring Plan for the Interim Action Ground Water Treatment System, February 2007*. Although not listed here, the normal set of locations were sampled. Please refer to the attached trip report (Attachment 1) for specific sampled locations and an explanation of why some locations were not sampled, such as dry conditions at specific surface water locations.

The data validations indicate that the data meet the quality control criteria specified for this project. An adequate number of equipment blanks and duplicates were collected. No significant discrepancies were noted regarding sample shipping and receiving, preservation times, holding times, instrument calibration, method blanks, or matrix spikes, except as qualified or noted in the Laboratory Performance Assessment (Section 2.2).

There were no locations with anomalous data points.

According to the U.S. Geological Survey (USGS) Cisco Gaging Station, the mean daily Colorado River flow rates varied between 4,150 and 4,520 cubic feet per second (cfs) during this sampling period.


### 1.3.2 Ground Water/Surface Water Interaction Investigation Sampling Event

Sampling and analyses were conducted in accordance with the *Operations, Maintenance, and Performance Monitoring Plan for the Interim Action Ground Water Treatment System, February 2007*. Although not listed here, the normal set of locations were sampled. Please refer to the attached trip report (Attachment 2) for specific sampled locations and an explanation of why some locations were not sampled, such as dry conditions at specific locations.

The data validations indicate that the data meet the quality control criteria specified for this project. An inadequate number of equipment blanks and duplicates were collected; see the Water Sampling Field Activities Verification Checklist for details. No significant discrepancies were noted regarding sample shipping and receiving, preservation times, holding times, instrument calibration, method blanks, or matrix spikes, except as qualified or noted in the Laboratory Performance Assessment (Section 2.2).

There was one location with an anomalous data point. Well point 0606 in Configuration 1 had an undetermined high value of ammonia.

According to the U.S. Geological Survey (USGS) Cisco Gaging Station, the mean daily Colorado River flow rates varied between 3,160 and 3,610 cfs during this sampling period.

  
\_\_\_\_\_  
Ken Pill  
Ground Water Lead

  
\_\_\_\_\_  
Date

## **2.0 Data Assessment Summary**

This section contains the Water Sampling Field Activities Verification (Section 2.1), the Laboratory Performance Assessments (Section 2.2), the Field Analyses/Activities (Section 2.3), and Certification (Section 2.4).

### **2.1 Water Sampling Field Activities Verification**

The field activities verification process for these sampling events were documented using the following checklist. As the checklist exhibits, all sampling was conducted following the applicable procedures.

## Water Sampling Field Activities Verification Checklist

**Sampling Event / RIN** March 2008 Monthly / 0803009 **Date(s) of Water Sampling** March 11-13, 2008

**Date(s) of Verification** July 7, 2008 **Name of Verifier** Rachel Cowan

	<b>Response (Yes, No, NA)</b>	<b>Comments</b>
1. Is the SAP the primary document directing field procedures?	<u>Yes</u>	
List other documents, standard operating procedures, instructions.	<u>NA</u>	
2. Were the sampling locations specified in the planning documents sampled?	<u>Yes</u>	
3. Was a pre-trip calibration conducted as specified in the aforementioned documents?	<u>Yes</u>	
4. Was an operational check of the field equipment conducted twice daily?	<u>Yes</u>	
Did the operational checks meet criteria?	<u>Yes</u>	
5. Were the number and types (alkalinity, temperature, electrical conductivity, pH, turbidity, dissolved oxygen, oxidation reduction potential) of field measurements taken as specified?	<u>Yes</u>	
6. Was the category of the well documented?	<u>Yes</u>	
7. Were the following conditions met when purging a Category I well:		
Was one pump/tubing volume purged prior to sampling?	<u>Yes</u>	
Did the water level stabilize prior to sampling?	<u>Yes</u>	
Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?	<u>Yes</u>	
Was the flow rate less than 500 milliliters per minute (mL/min)?	<u>Yes</u>	
If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	<u>NA</u>	

## Water Sampling Field Activities Verification Checklist (continued)

- |   |     |  |
|---|-----|--|
| 8. Were the following conditions met when purging a Category II well:   |     |  |
| Was the flow rate less than 500 mL/min?   | Yes |  |
| Was one pump/tubing volume removed prior to sampling?   | Yes |  |
| 9. Were duplicates taken at a frequency of one per 20 samples?  | Yes |  |
| 10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment? | NA  | All ground water samples are collected using dedicated sampling equipment. |
| 11. Were trip blanks prepared and included with each shipment of volatile organic compound samples?                   | NA  |  |
| 12. Were Quality Control samples assigned a fictitious site identification number?                                    | Yes |  |
| Was the true identity of the samples recorded on the Quality Assurance Sample Log?                                    | Yes |  |
| 13. Were samples collected in the containers specified?   | Yes |  |
| 14. Were samples filtered and preserved as specified?   | Yes |  |
| 15. Were the number and types of samples collected as specified?  | Yes |  |
| 16. Were chain-of-custody (COC) records completed, and was sample custody maintained?                                 | Yes |  |
| 17. Are field data sheets signed and dated by both team members?  | Yes |  |
| 18. Was all other pertinent information documented on the field data sheets?  | Yes |  |
| 19. Was the presence or absence of ice in the cooler documented at every sample location?                             | Yes |  |
| 20. Were water levels measured at the locations specified in the planning documents?                                  | Yes |  |

## Water Sampling Field Activities Verification Checklist (continued)

<b>Sampling Event / RIN</b>	<u>March 2008 GW/SW Investigation / 0803010</u>	<b>Date(s) of Water Sampling</b>	<u>March 18-20, 2008</u>
<b>Date(s) of Verification</b>	<u>July 7, 2008</u>	<b>Name of Verifier</b>	<u>Rachel Cowan</u>

	<b>Response (Yes, No, NA)</b>	<b>Comments</b>
1. Is the SAP the primary document directing field procedures?	<u>Yes</u>	
List other documents, standard operating procedures, instructions.	<u>NA</u>	
2. Were the sampling locations specified in the planning documents sampled?	<u>Yes</u>	
3. Was a pre-trip calibration conducted as specified in the aforementioned documents?	<u>Yes</u>	
4. Was an operational check of the field equipment conducted twice daily?	<u>Yes</u>	
Did the operational checks meet criteria?	<u>Yes</u>	
5. Were the number and types (alkalinity, temperature, electrical conductivity, pH, turbidity, dissolved oxygen, oxidation reduction potential) of field measurements taken as specified?	<u>Yes</u>	
6. Was the category of the well documented?	<u>Yes</u>	
7. Were the following conditions met when purging a Category I well:		
Was one pump/tubing volume purged prior to sampling?	<u>Yes</u>	
Did the water level stabilize prior to sampling?	<u>Yes</u>	
Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?	<u>Yes</u>	
Was the flow rate less than 500 milliliters per minute (mL/min)?	<u>Yes</u>	
If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	<u>NA</u>	



## Water Sampling Field Activities Verification Checklist (continued)

- |   |     |   |
|---|-----|---|
| 8. Were the following conditions met when purging a Category II well:   |     |   |
| Was the flow rate less than 500 mL/min?   | Yes |   |
| Was one pump/tubing volume removed prior to sampling?   | Yes |   |
| 9. Were duplicates taken at a frequency of one per 20 samples?  | No  | Twenty-five samples were collected, but only one duplicate sample was collected.              |
| 10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment? | No  | Although two surface water samples were collected, no equipment blank samples were collected. |
| 11. Were trip blanks prepared and included with each shipment of volatile organic compound samples?                   | NA  |   |
| 12. Were Quality Control samples assigned a fictitious site identification number?                                    | Yes |   |
| Was the true identity of the samples recorded on the Quality Assurance Sample Log?                                    | Yes |   |
| 13. Were samples collected in the containers specified?   | Yes |   |
| 14. Were samples filtered and preserved as specified?   | Yes |   |
| 15. Were the number and types of samples collected as specified?  | Yes |   |
| 16. Were chain-of-custody (COC) records completed, and was sample custody maintained?                                 | Yes |   |
| 17. Are field data sheets signed and dated by both team members?  | Yes |   |
| 18. Was all other pertinent information documented on the field data sheets?  | Yes |   |
| 19. Was the presence or absence of ice in the cooler documented at every sample location?                             | Yes |   |
| 20. Were water levels measured at the locations specified in the planning documents?                                  | Yes |   |

## 2.2 Laboratory Performance Assessments

### 2.2.1 Monthly Sampling Event

#### General Information

Requisition No.: 0803009  
Sample Event: Interim Action Well Field Monthly Sampling Event,  
March 2008  
Site(s): Moab, UT  
Laboratory: Paragon Analytics, Fort Collins, Colorado  
Sample Data Group  
(SDG) No.: 0803096  
Analysis: Metals and Inorganics  
Validator: Rebecca Hollis  
Review Date: July 19, 2008

This validation was performed according to the *Environmental Procedures Catalog*, “Standard Practice for Validation of Laboratory Data,” GT-9(P) (2006). The procedure was applied at Level 1, Data Deliverables Examination. The Level 1 validation was performed on 100 percent of the samples, which included review of the chain of custody, case narratives, field and sample identifications, holding times, and preservation and cooler receipt. When the case narrative identified items of concern, these items were further investigated in a targeted Level 3 validation. All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 2.

*Table 2. Interim Action Analytes and Methods*

Analyte	Line Item Code	Prep Method	Analytical Method
Ammonia as N	WCH-A-005	EPA 350.1	EPA 350.1
Bromide	MIS-A-038	SW-846 9056	SW-846 9056
Chloride	MIS-A-039	SW-846 9056	SW-846 9056
Copper	MET-A-022	SW-846 3005A	SW-846 6010
Manganese	GJO-17	SW-846 3005A	SW-846 6010
Selenium	GJO-14	SW-846 3005A	SW-846 6020
Sulfate	MIS-A-044	SW-846 9056	SW-846 9056
Total Dissolved Solids	WIC-A-033	MCAWW 160.1	MCAWW 160.1
Uranium	GJO-01	SW-846 3005A	SW-846 6020

#### Data Qualifier Summary

Analytical results were qualified as listed in Table 3. Refer to the attached validation worksheets and Table 4 below for an explanation of the data qualifiers applied.

Table 3. Interim Action Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
All	All	Ammonia as N	J	MS1

Note: J indicates results are estimated. For nondetected results, flag becomes UJ

Table 4. Interim Action Reason Codes for Data Flags

Reason Code	Explanation
MS1	Results for the affected analyte(s) are regarded as estimated (J) because the matrix spike sample was (a) from another client, (b) of dissimilar matrix, (c) a field blank or equipment blank, or (d) not analyzed at the proper frequency as stated in the appropriate analytical method.

### Sample Shipping/Receiving

Paragon Analytics in Fort Collins, Colorado, received a total of 19 samples for Report Identification Number (RIN) 0803009 that arrived on March 14, 2008, under UPS tracking number 1Z5W1Y510197210682. All sample groups were accompanied by Chain of Custody (COC) forms. The COC forms were checked to confirm that all of the samples were listed on each form with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents, including the COC forms and the sample tickets, had no errors or omissions.

### Preservation and Holding Times

The sample shipments were received intact with the temperatures within the cooler at 0.6 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

### Case Narratives

The case narratives were reviewed and all detects were found to be within quality control procedures except for the following:

#### *Matrix Spike and Replicate Analysis*

Matrix spike (MS) sample analysis is performed as a measure of the ability to recover analytes in a particular matrix. If the native sample concentration is greater than four times the spike concentration, MS criteria do not apply. Replicate sample (RS) analysis consists of matrix spike duplicate (MSD) samples and field duplicates that are indicators of laboratory precision for each sample matrix.

#### *Method EPA 350.1, Ammonia as N*

The ammonia duplicate sample prepared for this SDG was not the selected quality control sample for the analytical run in which the samples were evaluated. Therefore all ammonia results

were qualified with a “J” flag. However, the associated field duplicate sample passed validation criteria, so ammonia results were not J-flagged for failing the RS check.

### Field Duplicate

A field duplicate was collected during actual sampling activities. It was labeled with blind identification and submitted with the regular samples to be analyzed by Paragon Analytics. Sample 0803096-19 (2492) was the blind duplicate sample taken from location 0479. This sample passed the Environmental Protection Agency (EPA) criteria of  $\pm 20$  relative percent difference (RPD) for all analytes.

### Laboratory Control Sample

A laboratory control sample (LCS) must be analyzed at the correct frequency (one LCS per SDG) to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. LCSs were prepared and analyzed as appropriate with the following exception:

LCSs were not reported for copper, manganese, or uranium. As a standard practice, Paragon Analytics does not prepare LCSs for samples that were field filtered and acidified and then run directly on the instrument without any additional sample preparation. Per national environmental laboratory accreditation requirements provided by the National Environmental Laboratory Accreditation Conference, a matrix spike may be used in place of an LCS provided the acceptance criteria are as stringent. MS samples for copper, manganese, and uranium passed criteria, so no samples were flagged for LCSs.

### Detection Limits/Dilutions

The required detection limit (RDL) for all analytes was achieved for all SDGs. Serial dilution samples were required for inductively coupled plasma (ICP) sample analysis (copper, manganese, selenium, and uranium). The percent recovery of the serial dilution sample was out of range for selenium. However, the concentration of the native sample was less than 100 times the practical quantitation limit (PQL). Therefore, no qualification of the sample was required.

### Completeness

Results were reported in the correct units for all analytes requested using contract required laboratory qualifiers.

### Electronic Data Deliverable File

The Electronic Data Deliverable (EDD) files arrived on March 27, 2008. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the sample data package and that all and only the requested data were delivered with one exception. Sample 080803096-11 was analyzed for copper although not requested on the chain of custody/sample submittal form or the sample tickets.

## 2.2.2 Ground Water/Surface Water Interaction Investigation Sampling Event

### General Information

Requisition No.: 0803010  
Sample Event: Interim Action Well Field Ground Water/Surface Water Interaction Investigation Sampling Event, March 2008  
Site(s): Moab, UT  
Laboratory: Paragon Analytics, Fort Collins, CO  
SDG No.: 0803147  
Analysis: Metals and Inorganics  
Validator: Rebecca Hollis  
Review Date: September 12, 2008

This validation was performed according to the *Environmental Procedures Catalog*, “Standard Practice for Validation of Laboratory Data,” GT-9(P) (2006). The procedure was applied at Level 3, Data Deliverables Examination, on 100 percent of the data. See attached Data Validation Worksheets for supporting documentation on the data review and validation. All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 5.

*Table 5. Ground Water/Surface Water Interaction Investigation Sampling Event Analytes and Methods*

<b>Analyte</b>	<b>Line Item Code</b>	<b>Prep Method</b>	<b>Analytical Method</b>
Ammonia as N	WCH-A-005	MCAWW 350.1	MCAWW 350.1
Bromide	MIS-A-038	SW-846 9056	SW9056
Calcium	MET-A-020	SW-846 3005A	SW6010
Chloride	MIS-A-039	SW-846 9056	SW9056
Copper	MET-A-020	SW-846 3005A	SW6010
Magnesium	MET-A-020	SW-846 3005A	SW6010
Manganese	G17	SW-846 3005A	SW6010
Potassium	MET-A-020	SW-846 3005A	SW6010
Selenium	G14	SW-846 3005A	SW6020
Sodium	MET-A-020	SW-846 3005A	SW6010
Sulfate	MIS-A-044	SW-846 9056	SW9056
Total Dissolved Solids	WIC-A-033	MCAWW 160.1	MCAWW 160.1
Uranium	G1	SW-846 3005A	SW6020

### Data Qualifier Summary

Analytical results were qualified as listed in Table 6. Refer to Table 7 below for an explanation of the data qualifiers applied.

*Table 6. Ground Water/Surface Water Interaction Investigation Sampling Event Data Qualifiers*

Sample Number	Location	Analyte	Flag	Reason
0803147-18	561	Copper	J	B3
All samples in SDG 0803147	All locations sampled as part of this sampling event	Chloride	J	MS1, RS1
All samples in SDG 0803147	All locations sampled as part of this sampling event	Sulfate	J	MS1, RS1
All samples in SDG 0803147	All locations sampled as part of this sampling event	Potassium	J	MS2
0803147-1, -2	0216, 0243	All analytes	J	B1

Note: J indicates results are estimated. For nondetected results, flag becomes UJ.

*Table 7. Ground Water/Surface Water Interaction Investigation Sampling Event Reason Codes for Data Flags*

Reason Code	Explanation
B1	Results are considered estimated (J) because the blank frequency criteria were not met.
B3	Detections < five times the MDL are possibly biased because the blank was negative and its absolute value was > MDL but ≤ PQL.
MS1	Matrix spike samples were not analyzed at the proper frequency as stated in the appropriate analytical method.
RS1	Replicate samples were not analyzed at the proper frequency as stated in the appropriate analytical method.
MS2	Matrix spike recovery is >125%.

Note: < = less than; > = greater than; ≤ = less than or equal to.

### Sample Shipping/Receiving

Paragon Analytics in Fort Collins, Colorado, received a total of 26 samples for SDG 0803147 that arrived on March 24, 2008, under UPS tracking number 1Z5W1Y510196838735. All sample groups were accompanied by COC forms. The COC forms were checked to confirm that all of the samples were listed on each form with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents, including the COC forms and the sample tickets, had no errors or omissions with the following exception:

The label on sample 19 recorded the collection time as 10:10. The ticket and COC said 10:00. All other information matched, therefore it was determined that this error did not require qualification of the sample.

### Preservation and Holding Times

The sample shipment was received intact with the temperature within the coolers at 3.6 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

## Laboratory Instrument Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for all analytes. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear curve. Compliance requirements for continuing calibration checks are established to ensure that the instrument continues to be capable of producing acceptable qualitative and quantitative data. All laboratory instrument calibrations were performed correctly in accordance with the cited methods.

### *Method SW-846 6010B, Calcium, Copper, Magnesium, Manganese, Potassium, and Sodium*

Calibrations for calcium, copper, magnesium, manganese, potassium, and sodium were performed on April 1, 2008. An additional calibration for sodium was performed on April 2, 2008. All calibrations used three calibration standards and a blank. Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification (ICV and CCV) checks were made at the required frequency, resulting in 17 CCVs for the analysis on April 1 and 17 CCVs for the April 2 analysis. All calibration checks met the acceptance criteria. Reporting limit verification checks (CRIs) were made at the required frequency to verify the linearity of the calibration curve near the PQL. The CRI results were within the acceptance range.

### *Method SW-846 6020A, Selenium and Uranium*

The calibration for the selenium analyses was performed on April 2, 2008. The uranium calibration was performed on April 1, 2008. The initial calibrations for both analytes were performed using eight calibration standards and one blank, resulting in calibration curves with correlation coefficient ( $r^2$ ) values greater than 0.995. The absolute values of the calibration curve intercepts were less than three times the method detection limit (MDL). Calibration and laboratory spike standards were prepared from independent sources. ICV and CCV checks were made at the required frequency, resulting in 15 CCVs for selenium and 15 CCVs for uranium. All calibration checks met the acceptance criteria. A CRI was made at the required frequency to verify the linearity of the calibration curve near the PQL. The CRI checks were within the acceptance criteria range. Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure. Internal standard recoveries were stable and within acceptable ranges.

### *Method MCAWW 350.1, Ammonia as N*

Initial calibration for ammonia as N was performed using six calibration standards and a blank on March 25, 2008. The calibration curve had a correlation coefficient value ( $r^2$ ) greater than 0.995 and an intercept less than three times the MDL. ICV and CCV checks were made at the required frequency resulting in four CCVs. All calibration check results were within the acceptance criteria.

### *Method SW-846 9056, Bromide, Chloride, and Sulfate*

Initial calibrations for bromide, chloride, and sulfate were performed using five calibration



standards and a blank on March 20, 2008, and again on March 25, 2008. The calibration curve  $r^2$  values were greater than 0.995, and intercepts were less than three times the MDL. Initial calibration and calibration check standards were prepared from independent sources. ICV and CCV checks were made at the required frequency, resulting in eight CCVs on March 24, 2008, six CCVs on March 25, 2008, and two CCVs on March 26, 2008. All calibration checks met the acceptance criteria.

#### *Method MCAWW160.1, Total Dissolved Solids (TDS)*

There is no initial or continuing calibration requirement associated with the determination of TDS.

#### Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis. Detected sample results associated with blanks results greater than the method detection limit or instrument detection limit (depending on method requirements) were “J” qualified when the detections were less than five times the blank concentration. Nondetects were not qualified.

Occasionally blanks results were negative and had absolute values greater than the method detection limit or instrument detection limit. Samples (including nondetects) associated with these blank results were “J” qualified when the results were less than five times the method detection limit/instrument detection limit (MDL/IDL) concentration.

No equipment blank was provided for analysis for these samples. Analysis of the blanks as described above resulted in qualification of the following samples:

Copper sample 0803147-18 was “J” qualified as its concentration was less than five times the instrument detection limit and therefore might be biased by the negative result of one of its associated continuing calibration blanks which had an absolute value of its concentration in excess of the instrument detection limit.

#### Equipment Blanks

Equipment blanks (EBs) are samples of analyte-free media that have been used to rinse the non-dedicated sampling equipment, which is used to sample surface water. EBs are collected to document adequate decontamination of non-dedicated equipment. EBs are considered to be preparation blanks, and one EB should be prepared with each preparation batch.

#### *Surface Water Samples*

The only samples collected on nondedicated equipment were surface water samples from location 0216 and 0243. Since no EBs were collected, all results from these locations were “J” qualified for this reason.

### ICP Interference Check Sample Analysis

ICP interference check samples (ICS) ICSA and ICSAB were analyzed at the required frequency to verify the instrument interelement and background correction factors. ICSA values for calcium, magnesium, aluminum, and iron were not provided for verification of the instrument's interelement and background correction factors for uranium and selenium analyses. The percent recoveries of the ICSAB samples were provided and were acceptable. All other check sample results met the acceptance criteria so no qualification of the sample results was deemed necessary.

### Matrix Spike Analysis

MS/MSD pairs were analyzed for all analytes as a measure of method performance in the sample matrix. The spike recoveries met the recovery and precision criteria for all analytes, with the following exceptions:

- MS recoveries could not be evaluated for the chloride or sulfate samples because the analyte concentrations in the native sample were above the analytical range. Therefore all chloride and sulfate sample results were qualified "J" for detects and "UJ" for nondetects.
- MS recoveries were greater than 125 percent for potassium analyses. Thus, all potassium sample results were qualified "J" for detects and "UJ" for nondetects.

### Laboratory Replicate Analysis

The laboratory replicate results demonstrate acceptable laboratory precision. The RPD values for the reported laboratory RS and the MSD sample results for all analytes were less than 20 percent for results greater than five times the PQL with the following exceptions:

- The RPD could not be determined for the chloride or sulfate duplicates because the analyte concentrations in the native sample were above the analytical range. Therefore all detects for chloride, and sulfate were qualified as "J" and all nondetects as "UJ."

### Field Duplicate Analysis

Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and has more variability than laboratory replicates, which measure only laboratory performance. A duplicate sample was collected from location 0488 on March 19, 2008. The duplicate results met the EPA recommended laboratory duplicate criteria of less than 20 RPD for results that are greater than five times the PQL.

### Laboratory Control Sample

LCSs provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. LCS results were acceptable for all analyses with the following exceptions:

- LCSs were not reported for calcium, copper, magnesium, manganese, potassium, sodium, or uranium. As a standard practice, Paragon Analytics does not prepare LCSs for samples that were field filtered and acidified and run directly on the instrument without any additional sample preparation. Per national environmental laboratory accreditation requirements provided by the National Environmental Laboratory Accreditation Conference, an MS may be used in place of an LCS provided the acceptance criteria are as stringent; therefore, no qualification was required because of lack of LCS results. See Matrix Spike Analysis section for required qualification.

#### Metals Serial Dilution

Serial dilutions were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. ICP-MS serial dilution data are evaluated when the concentration of the undiluted sample is greater than 100 times the PQL. ICP serial dilution data are evaluated when the concentration of the undiluted sample is greater than 50 times the PQL. All evaluated serial dilution data were acceptable.

#### Detection Limits/Dilutions

Dilutions were prepared in a consistent and acceptable manner when dilutions were required. The RDLs were achieved for all analytes.

#### Completeness

Results were reported in the correct units for all analytes requested using contract required laboratory qualifiers.

#### Electronic Data Deliverable File

The Electronic Data Deliverable (EDD) files arrived on April 7, 2008. The contents of the EDD were manually examined to ensure all and only the requested data are delivered in compliance with requirements and that the sample results accurately reflect the data contained in the sample data package. One discrepancy was noted: a copper result for sample 0803147-1 was reported in the EDD. This analysis was not requested in the COC forms or sample tickets.

Reports Prepared By: W B 21 For

Rebecca Hollis

## 2.3 Field Analyses/Activities

### 2.3.1 Monthly Sampling Event

The following information summarizes the field analyses and activities for the March 2008 monthly sampling event.

#### Field Activities

All monitor wells were purged and sampled using the low-flow sampling method; this method was not used at extraction wells. All samples were collected on dedicated equipment. One duplicate sample was collected. There are no established regulatory criteria for the evaluation of field duplicate samples; therefore, EPA guidance for laboratory duplicates (which is conservative for field duplicates) was used to assess the precision of the field duplicates. All results met the criteria of  $\pm 20$  RPD and are considered acceptable.

### 2.3.2 Ground Water/Surface Water Interaction Investigation Sampling Event

The following information summarizes the field analyses and activities for the March 2008 ground water/surface water interaction investigation sampling event.

#### Field Activities

All monitor wells were purged and sampled using the low-flow sampling method; this method was not used at extraction wells. All samples were collected on dedicated equipment. One duplicate sample was collected. There are no established regulatory criteria for the evaluation of field duplicate samples; therefore, EPA guidance for laboratory duplicates (which is conservative for field duplicates) was used to assess the precision of the field duplicates. All results met the criteria of  $\pm 20$  RPD and are considered acceptable.

## 2.4 Certification

Results were reported in correct units for all analytes requested. Appropriate contract required laboratory qualifiers and target analyte lists were used. The RDLs were met when possible, or an explanation of why they were not met was given in the laboratory case narrative. All analytical quality control criteria were met except as qualified on the Ground Water Quality Data by Parameter, Surface Water Quality by Parameter, or equipment/trip blank database printouts. The meaning of data qualifiers is defined on the database printouts or defined in the EPA *Contract Laboratory Program Statement of Work for Inorganic Analysis, Multi-Media Multi-Concentration*, Document Number ILMO2.0, 1991. All data in this package are considered validated and may be treated as final results.

Laboratory Validation Lead:

WR 1, For  
Rebecca Hollis

12/30/03  
Date

Ground Water Lead:

WR 1  
Ken Pill

12/30/03  
Date

## **3.0 Data Presentation**

This section contains the Minimums and Maximums Reports (Section 3.1), the Anomalous Data Review Check Sheets (Section 3.2), a table containing the Water Quality and Water Level Data (Sections 3.3 and 3.4, respectively), and the Blanks Reports (Section 3.5).

### **3.1 Minimums and Maximums Reports**

The Minimums and Maximums Report is generated by the Sample Management System used to query the SEEPro database. The DataVal program compares the new data set with historical data and lists all new data that fall outside the historical data range. Values listed in the report are further screened, and the results are not considered anomalous if: (1) identified low concentrations are the result of low detection limits; (2) the concentration detected is within 50 percent of historical minimum or maximum values; or (3) there were fewer than five historical samples for comparison.

#### *3.1.1 Monthly Sampling Event*

# Data Validation Minimums and Maximums Report - No Field Parameters

Laboratory: PARAGON (Fort Collins, CO)

RIN: 0803009

Comparison: All Historical Data

Report Date: 7/16/2008

Site Code	Location Code	Sample Date	Analyte	Current		Historical Maximum		Historical Minimum		Count	
				Result	Qualifiers Lab Data	Result	Qualifiers Lab Data	Result	Qualifiers Lab Data	N	N Below Detect
MOA01	0484	03/13/2008	Ammonia Total as N	620		1600	F	650		39	0
MOA01	0484	03/13/2008	Chloride	3800		22000	F	5300	J	39	0
MOA01	0484	03/13/2008	Total Dissolved Solids	18000		41000	F	19000		39	0
MOA01	0600	03/11/2008	Ammonia Total as N	960		800	F	370	F	15	0
MOA01	0781	03/11/2008	Sulfate	4800		9400	F	4900	F	20	0
MOA01	0786	03/11/2008	Ammonia Total as N	820		800		27		18	0

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

## LAB QUALIFIERS:

*	Replicate analysis not within control limits.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
C	Pesticide result confirmed by GC-MS.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
H	Holding time expired, value suspect.
I	Increased detection limit due to required dilution.
J	Estimated
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
P	> 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
U	Analytical result below detection limit.
W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X,Y,Z	Laboratory defined qualifier, see case narrative.

## DATA QUALIFIERS:

F	Low flow sampling method used.	G	Possible grout contamination, pH > 9.	J	Estimated value.
L	Less than 3 bore volumes purged prior to sampling.	Q	Qualitative result due to sampling technique.	R	Unusable result.
U	Parameter analyzed for but was not detected.	X	Location is undefined.		

### *3.1.2 Ground Water/Surface Water Interaction Investigation Sampling Event*



# Data Validation Minimums and Maximums Report - No Field Parameters

Laboratory: PARAGON (Fort Collins, CO)

RIN: 0803010

Comparison: All Historical Data

Report Date: 7/21/2008

Site Code	Location Code	Sample Date	Analyte	Current		Historical Maximum			Historical Minimum			Count	
				Result	Qualifiers Lab Data	Result	Qualifiers Lab Data		Result	Qualifiers Lab Data		N	N Below Detect
MOA01	0482	03/18/2008	Sulfate	5300		7000	J		5800	F		22	0
MOA01	0485	03/18/2008	Ammonia Total as N	650		640	F		420	F		21	0
MOA01	0557	03/18/2008	Sulfate	8100		15000	F		8200	J		43	0
MOA01	0558	03/18/2008	Manganese	7.8		12	J		8	J		12	0
MOA01	0558	03/18/2008	Total Dissolved Solids	39000		80000	F		41000	F		32	0
MOA01	0560	03/18/2008	Ammonia Total as N	2400		2200	F		650	F		43	0
MOA01	0561	03/18/2008	Manganese	7.9		67	F		8.2			6	0
MOA01	0561	03/18/2008	Total Dissolved Solids	87000		86000	F		71000	F		18	0
MOA01	0606	03/19/2008	Ammonia Total as N	500		300			52.5	QF		16	0
MOA01	0606	03/19/2008	Chloride	3000		2530	QF		2	U	QF	18	2
MOA01	0606	03/19/2008	Total Dissolved Solids	12000		10100	QF		941		QF	18	0
MOA01	0606	03/19/2008	Uranium	1.2		1.12	FQ		0.0187	B	F	15	0
MOA01	SMI-PW01	03/20/2008	Chloride	990		16998			1000		J	31	0
MOA01	SMI-PW01	03/20/2008	Sulfate	6000		14569			6600		J	31	0

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

## LAB QUALIFIERS:

- \* Replicate analysis not within control limits.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.

C Pesticide result confirmed by GC-MS.  
 D Analyte determined in diluted sample.  
 E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.  
 H Holding time expired, value suspect.  
 I Increased detection limit due to required dilution.  
 J Estimated  
 N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).  
 P > 25% difference in detected pesticide or Aroclor concentrations between 2 columns.  
 U Analytical result below detection limit.  
 W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.  
 X,Y,Z Laboratory defined qualifier, see case narrative.

DATA QUALIFIERS:

F	Low flow sampling method used.	G	Possible grout contamination, pH > 9.	J	Estimated value.
L	Less than 3 bore volumes purged prior to sampling.	Q	Qualitative result due to sampling technique.	R	Unusable result.
U	Parameter analyzed for but was not detected.	X	Location is undefined.		

### 3.2 Anomalous Data Review Checksheet

As exhibited by the Minimums and Maximums Reports, there are no anomalous data associated with the monthly sampling event, and only one anomalous data point associated with ground water/surface water interaction investigation sampling event.

Loc. No.	Analyte	Type of Anomaly	Disposition
0606	Ammonia	High	Undetermined

Site: Moab Processing Site

Sampling Dates: March 11 – 13, 2008  
March 18 – 20, 2008

Reviewer:

Rachel Cowan  
Name

*RW Cowan*  
Signature

12/30/08  
Date

Site Lead:

Joe Ritchey  
Name

*Joe Ritchey*  
Signature

12/31/08  
Date

### **3.3 Water Quality Data**

#### **3.3.1 Monthly Sampling Event**

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 7/16/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	0401	WL	03/11/2008	0001	18	-	18	860			0		
Alkalinity, Total (As CaCO3)	mg/L	0471	WL	03/13/2008	0001	10.3	-	19.7	920			0		
Alkalinity, Total (As CaCO3)	mg/L	0473	WL	03/13/2008	0001	10.3	-	19.7	820			0		
Alkalinity, Total (As CaCO3)	mg/L	0477	WL	03/13/2008	0001	10.3	-	19.7	960			0		
Alkalinity, Total (As CaCO3)	mg/L	0479	WL	03/13/2008	0001	9.3	-	23.6	840			0		
Alkalinity, Total (As CaCO3)	mg/L	0484	WL	03/13/2008	0001	28	-	28	830			0		
Alkalinity, Total (As CaCO3)	mg/L	0584	WL	03/11/2008	0001	18	-	18	976			0		
Alkalinity, Total (As CaCO3)	mg/L	0587	WL	03/11/2008	0001	18	-	18	756			0		
Alkalinity, Total (As CaCO3)	mg/L	0600	WL	03/11/2008	0001	28	-	28	1042			0		
Alkalinity, Total (As CaCO3)	mg/L	0683	WL	03/12/2008	0001	27	-	27	660			0		
Alkalinity, Total (As CaCO3)	mg/L	0686	WL	03/12/2008	0001	18	-	18	546			0		
Alkalinity, Total (As CaCO3)	mg/L	0687	WL	03/11/2008	0001	28	-	28	656			0		
Alkalinity, Total (As CaCO3)	mg/L	0688	WL	03/11/2008	0001	39	-	39	814			0		
Alkalinity, Total (As CaCO3)	mg/L	0689	WL	03/11/2008	0001	54	-	54	972			0		
Alkalinity, Total (As CaCO3)	mg/L	0781	WL	03/11/2008	0001	46	-	46	326			0		
Alkalinity, Total (As CaCO3)	mg/L	0782	WL	03/11/2008	0001	31	-	31	300			0		
Alkalinity, Total (As CaCO3)	mg/L	0786	WL	03/11/2008	0001	28	-	28	626			0		
Alkalinity, Total (As CaCO3)	mg/L	0787	WL	03/11/2008	0001	36	-	36	200			0		
Ammonia Total as N	mg/L	0401	WL	03/11/2008	0001	18	-	18	520			0	20	
Ammonia Total as N	mg/L	0471	WL	03/13/2008	0001	10.3	-	19.7	730			0	20	
Ammonia Total as N	mg/L	0473	WL	03/13/2008	0001	10.3	-	19.7	580			0	20	
Ammonia Total as N	mg/L	0477	WL	03/13/2008	0001	10.3	-	19.7	430			0	20	
Ammonia Total as N	mg/L	0479	WL	03/13/2008	0001	9.3	-	23.6	430			0	20	
Ammonia Total as N	mg/L	0479	WL	03/13/2008	0002	9.3	-	23.6	400			0	20	
Ammonia Total as N	mg/L	0484	WL	03/13/2008	0001	28	-	28	620			0	20	
Ammonia Total as N	mg/L	0584	WL	03/11/2008	0001	18	-	18	540			0	20	

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 7/16/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	0587	WL	03/11/2008	0001	18	-	18	180			0	20	
Ammonia Total as N	mg/L	0600	WL	03/11/2008	0001	28	-	28	960			0	20	
Ammonia Total as N	mg/L	0683	WL	03/12/2008	0001	27	-	27	390			0	20	
Ammonia Total as N	mg/L	0686	WL	03/12/2008	0001	18	-	18	8.3			0	0.5	
Ammonia Total as N	mg/L	0687	WL	03/11/2008	0001	28	-	28	370			0	20	
Ammonia Total as N	mg/L	0688	WL	03/11/2008	0001	39	-	39	600			0	20	
Ammonia Total as N	mg/L	0689	WL	03/11/2008	0001	54	-	54	950			0	20	
Ammonia Total as N	mg/L	0781	WL	03/11/2008	0001	46	-	46	190			0	20	
Ammonia Total as N	mg/L	0782	WL	03/11/2008	0001	31	-	31	620			0	20	
Ammonia Total as N	mg/L	0786	WL	03/11/2008	0001	28	-	28	820			0	20	
Ammonia Total as N	mg/L	0787	WL	03/11/2008	0001	36	-	36	190			0	20	
Bromide	mg/L	0401	WL	03/11/2008	0001	18	-	18	2	U		0	2	
Bromide	mg/L	0471	WL	03/13/2008	0001	10.3	-	19.7	2	U		0	2	
Bromide	mg/L	0473	WL	03/13/2008	0001	10.3	-	19.7	2.3			0	2	
Bromide	mg/L	0477	WL	03/13/2008	0001	10.3	-	19.7	2	U		0	2	
Bromide	mg/L	0479	WL	03/13/2008	0001	9.3	-	23.6	2	U		0	2	
Bromide	mg/L	0479	WL	03/13/2008	0002	9.3	-	23.6	2	U		0	2	
Bromide	mg/L	0484	WL	03/13/2008	0001	28	-	28	2	U		0	2	
Bromide	mg/L	0584	WL	03/11/2008	0001	18	-	18	2	U		0	2	
Bromide	mg/L	0587	WL	03/11/2008	0001	18	-	18	2	U		0	2	
Bromide	mg/L	0600	WL	03/11/2008	0001	28	-	28	2	U		0	2	
Bromide	mg/L	0683	WL	03/12/2008	0001	27	-	27	2	U		0	2	
Bromide	mg/L	0686	WL	03/12/2008	0001	18	-	18	1	U		0	1	
Bromide	mg/L	0687	WL	03/11/2008	0001	28	-	28	2	U		0	2	
Bromide	mg/L	0688	WL	03/11/2008	0001	39	-	39	2	U		0	2	
Bromide	mg/L	0689	WL	03/11/2008	0001	54	-	54	5.3			0	4	

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 7/16/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Bromide	mg/L	0781	WL	03/11/2008	0001	46	-	46	21			0	10	
Bromide	mg/L	0782	WL	03/11/2008	0001	31	-	31	18			0	10	
Bromide	mg/L	0786	WL	03/11/2008	0001	28	-	28	10	U		0	10	
Bromide	mg/L	0787	WL	03/11/2008	0001	36	-	36	22			0	10	
Chloride	mg/L	0401	WL	03/11/2008	0001	18	-	18	1800			0	40	
Chloride	mg/L	0471	WL	03/13/2008	0001	10.3	-	19.7	3200			0	40	
Chloride	mg/L	0473	WL	03/13/2008	0001	10.3	-	19.7	2800			0	40	
Chloride	mg/L	0477	WL	03/13/2008	0001	10.3	-	19.7	1900			0	40	
Chloride	mg/L	0479	WL	03/13/2008	0001	9.3	-	23.6	2200			0	40	
Chloride	mg/L	0479	WL	03/13/2008	0002	9.3	-	23.6	2200			0	40	
Chloride	mg/L	0484	WL	03/13/2008	0001	28	-	28	3800			0	40	
Chloride	mg/L	0584	WL	03/11/2008	0001	18	-	18	1600			0	40	
Chloride	mg/L	0587	WL	03/11/2008	0001	18	-	18	1600			0	40	
Chloride	mg/L	0600	WL	03/11/2008	0001	28	-	28	2500			0	40	
Chloride	mg/L	0683	WL	03/12/2008	0001	27	-	27	1800			0	40	
Chloride	mg/L	0686	WL	03/12/2008	0001	18	-	18	360			0	10	
Chloride	mg/L	0687	WL	03/11/2008	0001	28	-	28	1600			0	40	
Chloride	mg/L	0688	WL	03/11/2008	0001	39	-	39	1700			0	40	
Chloride	mg/L	0689	WL	03/11/2008	0001	54	-	54	11000			0	200	
Chloride	mg/L	0781	WL	03/11/2008	0001	46	-	46	47000			0	1000	
Chloride	mg/L	0782	WL	03/11/2008	0001	31	-	31	45000			0	1000	
Chloride	mg/L	0786	WL	03/11/2008	0001	28	-	28	18000			0	400	
Chloride	mg/L	0787	WL	03/11/2008	0001	36	-	36	51000			0	1000	
Copper	mg/L	0787	WL	03/11/2008	0001	36	-	36	0.21	B		0	0.028	

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 7/16/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	0401	WL	03/11/2008	0001	18	-	18	0.3			0		
Dissolved Oxygen	mg/L	0471	WL	03/13/2008	0001	10.3	-	19.7	2			0		
Dissolved Oxygen	mg/L	0473	WL	03/13/2008	0001	10.3	-	19.7	3.15			0		
Dissolved Oxygen	mg/L	0477	WL	03/13/2008	0001	10.3	-	19.7	2.61			0		
Dissolved Oxygen	mg/L	0479	WL	03/13/2008	0001	9.3	-	23.6	3.24			0		
Dissolved Oxygen	mg/L	0484	WL	03/13/2008	0001	28	-	28	0.36			0		
Dissolved Oxygen	mg/L	0584	WL	03/11/2008	0001	18	-	18	0.33			0		
Dissolved Oxygen	mg/L	0587	WL	03/11/2008	0001	18	-	18	0.47			0		
Dissolved Oxygen	mg/L	0600	WL	03/11/2008	0001	28	-	28	0.54			0		
Dissolved Oxygen	mg/L	0683	WL	03/12/2008	0001	27	-	27	0.61			0		
Dissolved Oxygen	mg/L	0686	WL	03/12/2008	0001	18	-	18	0.56			0		
Dissolved Oxygen	mg/L	0687	WL	03/11/2008	0001	28	-	28	0.62			0		
Dissolved Oxygen	mg/L	0688	WL	03/11/2008	0001	31	-	31	0.39			0		
Dissolved Oxygen	mg/L	0688	WL	03/11/2008	0001	39	-	39	0.42			0		
Dissolved Oxygen	mg/L	0689	WL	03/11/2008	0001	46	-	46	0.46			0		
Dissolved Oxygen	mg/L	0689	WL	03/11/2008	0001	54	-	54	0.46			0		
Dissolved Oxygen	mg/L	0781	WL	03/11/2008	0001	46	-	46	0.38			0		
Dissolved Oxygen	mg/L	0782	WL	03/11/2008	0001	31	-	31	1.1			0		
Dissolved Oxygen	mg/L	0786	WL	03/11/2008	0001	28	-	28	0.43			0		
Dissolved Oxygen	mg/L	0787	WL	03/11/2008	0001	36	-	36	0.39			0		
Manganese	mg/L	0401	WL	03/11/2008	0001	18	-	18	5.3			0	0.00076	
Manganese	mg/L	0471	WL	03/13/2008	0001	10.3	-	19.7	4.2			0	0.00076	
Manganese	mg/L	0473	WL	03/13/2008	0001	10.3	-	19.7	3.6			0	0.00076	
Manganese	mg/L	0477	WL	03/13/2008	0001	10.3	-	19.7	4.1			0	0.00076	
Manganese	mg/L	0479	WL	03/13/2008	0001	9.3	-	23.6	4.2			0	0.00076	
Manganese	mg/L	0479	WL	03/13/2008	0002	9.3	-	23.6	4.1			0	0.00076	



**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
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Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Manganese	mg/L	0484	WL	03/13/2008	0001	28	-	28	5.1			0	0.0015	
Manganese	mg/L	0584	WL	03/11/2008	0001	18	-	18	4.9			0	0.00076	
Manganese	mg/L	0587	WL	03/11/2008	0001	18	-	18	3.5			0	0.00076	
Manganese	mg/L	0600	WL	03/11/2008	0001	28	-	28	5			0	0.00076	
Manganese	mg/L	0683	WL	03/12/2008	0001	27	-	27	5			0	0.00076	
Manganese	mg/L	0686	WL	03/12/2008	0001	18	-	18	1.7			0	0.00031	
Manganese	mg/L	0687	WL	03/11/2008	0001	28	-	28	4.7			0	0.00076	
Manganese	mg/L	0688	WL	03/11/2008	0001	39	-	39	4.5			0	0.00076	
Manganese	mg/L	0689	WL	03/11/2008	0001	54	-	54	6.1			0	0.0015	
Manganese	mg/L	0781	WL	03/11/2008	0001	46	-	46	7.6			0	0.0038	
Manganese	mg/L	0782	WL	03/11/2008	0001	31	-	31	8			0	0.0038	
Manganese	mg/L	0786	WL	03/11/2008	0001	28	-	28	6.5			0	0.0038	
Manganese	mg/L	0787	WL	03/11/2008	0001	36	-	36	7.2			0	0.0038	
Oxidation Reduction Potential	mV	0401	WL	03/11/2008	0001	18	-	18	176			0		
Oxidation Reduction Potential	mV	0471	WL	03/13/2008	0001	10.3	-	19.7	223			0		
Oxidation Reduction Potential	mV	0473	WL	03/13/2008	0001	10.3	-	19.7	201			0		
Oxidation Reduction Potential	mV	0477	WL	03/13/2008	0001	10.3	-	19.7	195			0		
Oxidation Reduction Potential	mV	0479	WL	03/13/2008	0001	9.3	-	23.6	185			0		
Oxidation Reduction Potential	mV	0484	WL	03/13/2008	0001	28	-	28	87			0		
Oxidation Reduction Potential	mV	0584	WL	03/11/2008	0001	18	-	18	111			0		
Oxidation Reduction Potential	mV	0587	WL	03/11/2008	0001	18	-	18	197			0		
Oxidation Reduction Potential	mV	0600	WL	03/11/2008	0001	28	-	28	107			0		
Oxidation Reduction Potential	mV	0683	WL	03/12/2008	0001	27	-	27	175			0		
Oxidation Reduction Potential	mV	0686	WL	03/12/2008	0001	18	-	18	160			0		

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
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Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	0687	WL	03/11/2008	0001	28	-	28	123			0		
Oxidation Reduction Potential	mV	0688	WL	03/11/2008	0001	31	-	31	122			0		
Oxidation Reduction Potential	mV	0688	WL	03/11/2008	0001	39	-	39	135			0		
Oxidation Reduction Potential	mV	0689	WL	03/11/2008	0001	46	-	46	114			0		
Oxidation Reduction Potential	mV	0689	WL	03/11/2008	0001	54	-	54	133			0		
Oxidation Reduction Potential	mV	0781	WL	03/11/2008	0001	46	-	46	161			0		
Oxidation Reduction Potential	mV	0782	WL	03/11/2008	0001	31	-	31	142			0		
Oxidation Reduction Potential	mV	0786	WL	03/11/2008	0001	28	-	28	91			0		
Oxidation Reduction Potential	mV	0787	WL	03/11/2008	0001	36	-	36	122			0		
pH	s.u.	0401	WL	03/11/2008	0001	18	-	18	6.66			0		
pH	s.u.	0471	WL	03/13/2008	0001	10.3	-	19.7	6.73			0		
pH	s.u.	0473	WL	03/13/2008	0001	10.3	-	19.7	6.9			0		
pH	s.u.	0477	WL	03/13/2008	0001	10.3	-	19.7	6.84			0		
pH	s.u.	0479	WL	03/13/2008	0001	9.3	-	23.6	6.9			0		
pH	s.u.	0484	WL	03/13/2008	0001	28	-	28	6.85			0		
pH	s.u.	0584	WL	03/11/2008	0001	18	-	18	6.67			0		
pH	s.u.	0587	WL	03/11/2008	0001	18	-	18	6.55			0		
pH	s.u.	0600	WL	03/11/2008	0001	28	-	28	6.79			0		
pH	s.u.	0683	WL	03/12/2008	0001	27	-	27	6.71			0		
pH	s.u.	0686	WL	03/12/2008	0001	18	-	18	6.67			0		
pH	s.u.	0687	WL	03/11/2008	0001	28	-	28	6.7			0		
pH	s.u.	0688	WL	03/11/2008	0001	31	-	31	6.72			0		
pH	s.u.	0688	WL	03/11/2008	0001	39	-	39	6.74			0		
pH	s.u.	0689	WL	03/11/2008	0001	54	-	54	6.8			0		

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 7/16/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
pH	s.u.	0689	WL	03/11/2008	0001	46	-	46	6.97			0		
pH	s.u.	0781	WL	03/11/2008	0001	46	-	46	6.7			0		
pH	s.u.	0782	WL	03/11/2008	0001	31	-	31	6.73			0		
pH	s.u.	0786	WL	03/11/2008	0001	28	-	28	6.69			0		
pH	s.u.	0787	WL	03/11/2008	0001	36	-	36	6.83			0		
Selenium	mg/L	0683	WL	03/12/2008	0001	27	-	27	0.021	E		0	0.00019	
Specific Conductance	umhos /cm	0401	WL	03/11/2008	0001	18	-	18	17024			0		
Specific Conductance	umhos /cm	0471	WL	03/13/2008	0001	10.3	-	19.7	19558			0		
Specific Conductance	umhos /cm	0473	WL	03/13/2008	0001	10.3	-	19.7	17527			0		
Specific Conductance	umhos /cm	0477	WL	03/13/2008	0001	10.3	-	19.7	15585			0		
Specific Conductance	umhos /cm	0479	WL	03/13/2008	0001	9.3	-	23.6	16570			0		
Specific Conductance	umhos /cm	0484	WL	03/13/2008	0001	28	-	28	22293			0		
Specific Conductance	umhos /cm	0584	WL	03/11/2008	0001	18	-	18	16162			0		
Specific Conductance	umhos /cm	0587	WL	03/11/2008	0001	18	-	18	14402			0		
Specific Conductance	umhos /cm	0600	WL	03/11/2008	0001	28	-	28	21135			0		
Specific Conductance	umhos /cm	0683	WL	03/12/2008	0001	27	-	27	16171			0		
Specific Conductance	umhos /cm	0686	WL	03/12/2008	0001	18	-	18	4786			0		
Specific Conductance	umhos /cm	0687	WL	03/11/2008	0001	28	-	28	15364			0		
Specific Conductance	umhos /cm	0688	WL	03/11/2008	0001	31	-	31	15354			0		
Specific Conductance	umhos /cm	0688	WL	03/11/2008	0001	39	-	39	16937			0		
Specific Conductance	umhos /cm	0689	WL	03/11/2008	0001	46	-	46	22976			0		
Specific Conductance	umhos /cm	0689	WL	03/11/2008	0001	54	-	54	43406			0		

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
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Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Specific Conductance	umhos /cm	0781	WL	03/11/2008	0001	46	-	46	106107			0		
Specific Conductance	umhos /cm	0782	WL	03/11/2008	0001	31	-	31	101730			0		
Specific Conductance	umhos /cm	0786	WL	03/11/2008	0001	28	-	28	53392			0		
Specific Conductance	umhos /cm	0787	WL	03/11/2008	0001	36	-	36	108612			0		
Sulfate	mg/L	0401	WL	03/11/2008	0001	18	-	18	8000			0	100	
Sulfate	mg/L	0471	WL	03/13/2008	0001	10.3	-	19.7	7400			0	100	
Sulfate	mg/L	0473	WL	03/13/2008	0001	10.3	-	19.7	6700			0	100	
Sulfate	mg/L	0477	WL	03/13/2008	0001	10.3	-	19.7	7100			0	100	
Sulfate	mg/L	0479	WL	03/13/2008	0001	9.3	-	23.6	7200			0	100	
Sulfate	mg/L	0479	WL	03/13/2008	0002	9.3	-	23.6	7200			0	100	
Sulfate	mg/L	0484	WL	03/13/2008	0001	28	-	28	8300			0	100	
Sulfate	mg/L	0584	WL	03/11/2008	0001	18	-	18	7600			0	100	
Sulfate	mg/L	0587	WL	03/11/2008	0001	18	-	18	6700			0	100	
Sulfate	mg/L	0600	WL	03/11/2008	0001	28	-	28	9600			0	100	
Sulfate	mg/L	0683	WL	03/12/2008	0001	27	-	27	7300			0	100	
Sulfate	mg/L	0686	WL	03/12/2008	0001	18	-	18	2200			0	25	
Sulfate	mg/L	0687	WL	03/11/2008	0001	28	-	28	6700			0	100	
Sulfate	mg/L	0688	WL	03/11/2008	0001	39	-	39	7600			0	100	
Sulfate	mg/L	0689	WL	03/11/2008	0001	54	-	54	13000			0	250	
Sulfate	mg/L	0781	WL	03/11/2008	0001	46	-	46	4800			0	1000	
Sulfate	mg/L	0782	WL	03/11/2008	0001	31	-	31	5900			0	1000	
Sulfate	mg/L	0786	WL	03/11/2008	0001	28	-	28	6800			0	1000	
Sulfate	mg/L	0787	WL	03/11/2008	0001	36	-	36	4800			0	25	

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 7/16/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Temperature	C	0401	WL	03/11/2008	0001	18	-	18	14.62			0		
Temperature	C	0471	WL	03/13/2008	0001	10.3	-	19.7	15.29			0		
Temperature	C	0473	WL	03/13/2008	0001	10.3	-	19.7	15.55			0		
Temperature	C	0477	WL	03/13/2008	0001	10.3	-	19.7	14.33			0		
Temperature	C	0479	WL	03/13/2008	0001	9.3	-	23.6	14.87			0		
Temperature	C	0484	WL	03/13/2008	0001	28	-	28	14.5			0		
Temperature	C	0584	WL	03/11/2008	0001	18	-	18	14.54			0		
Temperature	C	0587	WL	03/11/2008	0001	18	-	18	14.79			0		
Temperature	C	0600	WL	03/11/2008	0001	28	-	28	14.83			0		
Temperature	C	0683	WL	03/12/2008	0001	27	-	27	13.47			0		
Temperature	C	0686	WL	03/12/2008	0001	18	-	18	14.85			0		
Temperature	C	0687	WL	03/11/2008	0001	28	-	28	15.52			0		
Temperature	C	0688	WL	03/11/2008	0001	31	-	31	15.65			0		
Temperature	C	0688	WL	03/11/2008	0001	39	-	39	15.89			0		
Temperature	C	0689	WL	03/11/2008	0001	46	-	46	15.36			0		
Temperature	C	0689	WL	03/11/2008	0001	54	-	54	15.46			0		
Temperature	C	0781	WL	03/11/2008	0001	46	-	46	14.25			0		
Temperature	C	0782	WL	03/11/2008	0001	31	-	31	14.24			0		
Temperature	C	0786	WL	03/11/2008	0001	28	-	28	14.24			0		
Temperature	C	0787	WL	03/11/2008	0001	36	-	36	13.44			0		
Total Dissolved Solids	mg/L	0401	WL	03/11/2008	0001	18	-	18	15000			0	200	
Total Dissolved Solids	mg/L	0471	WL	03/13/2008	0001	10.3	-	19.7	16000			0	200	
Total Dissolved Solids	mg/L	0473	WL	03/13/2008	0001	10.3	-	19.7	14000			0	200	
Total Dissolved Solids	mg/L	0477	WL	03/13/2008	0001	10.3	-	19.7	14000			0	200	
Total Dissolved Solids	mg/L	0479	WL	03/13/2008	0001	9.3	-	23.6	15000			0	200	
Total Dissolved Solids	mg/L	0479	WL	03/13/2008	0002	9.3	-	23.6	14000			0	200	

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 7/16/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Total Dissolved Solids	mg/L	0484	WL	03/13/2008	0001	28	-	28	18000			0	200	
Total Dissolved Solids	mg/L	0584	WL	03/11/2008	0001	18	-	18	14000			0	200	
Total Dissolved Solids	mg/L	0587	WL	03/11/2008	0001	18	-	18	14000			0	200	
Total Dissolved Solids	mg/L	0600	WL	03/11/2008	0001	28	-	28	18000			0	200	
Total Dissolved Solids	mg/L	0683	WL	03/12/2008	0001	27	-	27	14000			0	200	
Total Dissolved Solids	mg/L	0686	WL	03/12/2008	0001	18	-	18	4500			0	80	
Total Dissolved Solids	mg/L	0687	WL	03/11/2008	0001	28	-	28	13000			0	200	
Total Dissolved Solids	mg/L	0688	WL	03/11/2008	0001	39	-	39	14000			0	200	
Total Dissolved Solids	mg/L	0689	WL	03/11/2008	0001	54	-	54	37000			0	400	
Total Dissolved Solids	mg/L	0781	WL	03/11/2008	0001	46	-	46	85000			0	1000	
Total Dissolved Solids	mg/L	0782	WL	03/11/2008	0001	31	-	31	85000			0	1000	
Total Dissolved Solids	mg/L	0786	WL	03/11/2008	0001	28	-	28	40000			0	2000	
Total Dissolved Solids	mg/L	0787	WL	03/11/2008	0001	36	-	36	90000			0	1000	
Turbidity	NTU	0401	WL	03/11/2008	0001	18	-	18	1.3			0		
Turbidity	NTU	0471	WL	03/13/2008	0001	10.3	-	19.7	4.44			0		
Turbidity	NTU	0473	WL	03/13/2008	0001	10.3	-	19.7	4.44			0		
Turbidity	NTU	0477	WL	03/13/2008	0001	10.3	-	19.7	4.65			0		
Turbidity	NTU	0479	WL	03/13/2008	0001	9.3	-	23.6	3.37			0		
Turbidity	NTU	0484	WL	03/13/2008	0001	28	-	28	6.79			0		
Turbidity	NTU	0584	WL	03/11/2008	0001	18	-	18	10.85			0		
Turbidity	NTU	0587	WL	03/11/2008	0001	18	-	18	1.42			0		
Turbidity	NTU	0600	WL	03/11/2008	0001	28	-	28	1.84			0		
Turbidity	NTU	0683	WL	03/12/2008	0001	27	-	27	3.04			0		
Turbidity	NTU	0686	WL	03/12/2008	0001	18	-	18	4.5			0		
Turbidity	NTU	0687	WL	03/11/2008	0001	28	-	28	4.54			0		
Turbidity	NTU	0688	WL	03/11/2008	0001	31	-	31	0.46			0		

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 7/16/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Turbidity	NTU	0688	WL	03/11/2008	0001	39	-	39	1.54			0		
Turbidity	NTU	0689	WL	03/11/2008	0001	54	-	54	5.5			0		
Turbidity	NTU	0689	WL	03/11/2008	0001	46	-	46	6.11			0		
Turbidity	NTU	0781	WL	03/11/2008	0001	46	-	46	1.52			0		
Turbidity	NTU	0782	WL	03/11/2008	0001	31	-	31	1.74			0		
Turbidity	NTU	0786	WL	03/11/2008	0001	28	-	28	0.73			0		
Turbidity	NTU	0787	WL	03/11/2008	0001	36	-	36	0.57			0		
Uranium	mg/L	0401	WL	03/11/2008	0001	18	-	18	2.2			0	0.0003	
Uranium	mg/L	0471	WL	03/13/2008	0001	10.3	-	19.7	2.5			0	0.0003	
Uranium	mg/L	0473	WL	03/13/2008	0001	10.3	-	19.7	2.4			0	0.0003	
Uranium	mg/L	0477	WL	03/13/2008	0001	10.3	-	19.7	2.8			0	0.0003	
Uranium	mg/L	0479	WL	03/13/2008	0001	9.3	-	23.6	3			0	0.0003	
Uranium	mg/L	0479	WL	03/13/2008	0002	9.3	-	23.6	2.9			0	0.0003	
Uranium	mg/L	0484	WL	03/13/2008	0001	28	-	28	2.7			0	0.0003	
Uranium	mg/L	0584	WL	03/11/2008	0001	18	-	18	2.5			0	0.0003	
Uranium	mg/L	0587	WL	03/11/2008	0001	18	-	18	3.2			0	0.0003	
Uranium	mg/L	0600	WL	03/11/2008	0001	28	-	28	3.2			0	0.0003	
Uranium	mg/L	0683	WL	03/12/2008	0001	27	-	27	2.1			0	0.0003	
Uranium	mg/L	0686	WL	03/12/2008	0001	18	-	18	0.79			0	0.0003	
Uranium	mg/L	0687	WL	03/11/2008	0001	28	-	28	2.2			0	0.0003	
Uranium	mg/L	0688	WL	03/11/2008	0001	39	-	39	2.1			0	0.0003	
Uranium	mg/L	0689	WL	03/11/2008	0001	54	-	54	2.7			0	0.0003	
Uranium	mg/L	0781	WL	03/11/2008	0001	46	-	46	0.3			0	5.9E-005	
Uranium	mg/L	0782	WL	03/11/2008	0001	31	-	31	0.56			0	0.0003	
Uranium	mg/L	0786	WL	03/11/2008	0001	28	-	28	1.8			0	0.0003	
Uranium	mg/L	0787	WL	03/11/2008	0001	36	-	36	0.13			0	3.E-005	

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

\* Replicate analysis not within control limits.  
> Result above upper detection limit.  
A TIC is a suspected aldol-condensation product.  
B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.  
C Pesticide result confirmed by GC-MS.  
D Analyte determined in diluted sample.  
E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.  
H Holding time expired, value suspect.  
I Increased detection limit due to required dilution.  
J Estimated  
N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).  
P > 25% difference in detected pesticide or Aroclor concentrations between 2 columns.  
U Analytical result below detection limit.  
W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.  
X,Y,Z Laboratory defined qualifier, see case narrative.

DATA QUALIFIERS:

F	Low flow sampling method used.	G	Possible grout contamination, pH > 9.	J	Estimated value.
L	Less than 3 bore volumes purged prior to sampling.	Q	Qualitative result due to sampling technique.	R	Unusable result.
U	Parameter analyzed for but was not detected.	X	Location is undefined.		

QA QUALIFIER:

# Validated according to quality assurance guidelines.



### *3.3.2 Ground Water/Surface Water Interaction Investigation Sampling Event*

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 11/7/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	0216	SL	03/19/2008	0001	0.08	-	0.25	144			#		
Alkalinity, Total (As CaCO3)	mg/L	0243	SL	03/19/2008	0001	0.25	-	0.25	144			#		
Alkalinity, Total (As CaCO3)	mg/L	0403	WL	03/18/2008	0001	18	-	18	812			#		
Alkalinity, Total (As CaCO3)	mg/L	0405	WL	03/19/2008	0001	18	-	18	639			#		
Alkalinity, Total (As CaCO3)	mg/L	0407	WL	03/18/2008	0001	17	-	17	932			#		
Alkalinity, Total (As CaCO3)	mg/L	0474	WL	03/19/2008	0001	10.3	-	19.7	831			#		
Alkalinity, Total (As CaCO3)	mg/L	0480	WL	03/18/2008	0001	18	-	18	887			#		
Alkalinity, Total (As CaCO3)	mg/L	0482	WL	03/18/2008	0001	55	-	55	288			#		
Alkalinity, Total (As CaCO3)	mg/L	0483	WL	03/18/2008	0001	18	-	18	790			#		
Alkalinity, Total (As CaCO3)	mg/L	0485	WL	03/18/2008	0001	55	-	55	252			#		
Alkalinity, Total (As CaCO3)	mg/L	0488	WL	03/19/2008	0001	36	-	36	849			#		
Alkalinity, Total (As CaCO3)	mg/L	0493	WL	03/19/2008	0001	55	-	55	1198			#		
Alkalinity, Total (As CaCO3)	mg/L	0495	WL	03/19/2008	0001	4.6	-	5.6	776			#		
Alkalinity, Total (As CaCO3)	mg/L	0557	WL	03/18/2008	0001	36	-	36	865			#		
Alkalinity, Total (As CaCO3)	mg/L	0558	WL	03/18/2008	0001	36	-	36	783			#		
Alkalinity, Total (As CaCO3)	mg/L	0559	WL	03/18/2008	0001	18	-	18	732			#		
Alkalinity, Total (As CaCO3)	mg/L	0560	WL	03/18/2008	0001	36	-	36	524			#		
Alkalinity, Total (As CaCO3)	mg/L	0561	WL	03/18/2008	0001	55	-	55	262			#		
Alkalinity, Total (As CaCO3)	mg/L	0562	WL	03/19/2008	0001	1.3	-	2.3	287			#		
Alkalinity, Total (As CaCO3)	mg/L	0563	WL	03/19/2008	0001	4.6	-	5.6	342			#		
Alkalinity, Total (As CaCO3)	mg/L	0597	WL	03/19/2008	0001	9.3	-	10.3	383			#		
Alkalinity, Total (As CaCO3)	mg/L	0606	WL	03/19/2008	0001	9.3	-	10.3	515			#		
Alkalinity, Total (As CaCO3)	mg/L	SMI-PW01	WL	03/20/2008	0001	36	-	36	680			#		
Alkalinity, Total (As CaCO3)	mg/L	SMI-PZ1M	WL	03/20/2008	0001	55	-	55	1010			#		
Alkalinity, Total (As CaCO3)	mg/L	SMI-PZ1S	WL	03/20/2008	0001	18	-	18	658			#		

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 11/7/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	0216	SL	03/19/2008	0001	0.08	-	0.25	1.2		J	#	0.1	
Ammonia Total as N	mg/L	0243	SL	03/19/2008	0001	0.25	-	0.25	0.36		J	#	0.1	
Ammonia Total as N	mg/L	0403	WL	03/18/2008	0001	18	-	18	460			#	20	
Ammonia Total as N	mg/L	0405	WL	03/19/2008	0001	18	-	18	260			#	20	
Ammonia Total as N	mg/L	0407	WL	03/18/2008	0001	17	-	17	200			#	20	
Ammonia Total as N	mg/L	0474	WL	03/19/2008	0001	10.3	-	19.7	670			#	20	
Ammonia Total as N	mg/L	0480	WL	03/18/2008	0001	18	-	18	570			#	20	
Ammonia Total as N	mg/L	0482	WL	03/18/2008	0001	55	-	55	690			#	20	
Ammonia Total as N	mg/L	0483	WL	03/18/2008	0001	18	-	18	650			#	20	
Ammonia Total as N	mg/L	0485	WL	03/18/2008	0001	55	-	55	650			#	20	
Ammonia Total as N	mg/L	0488	WL	03/19/2008	0001	36	-	36	870			#	20	
Ammonia Total as N	mg/L	0488	WL	03/19/2008	0002	36	-	36	860			#	20	
Ammonia Total as N	mg/L	0493	WL	03/19/2008	0001	55	-	55	1200			#	50	
Ammonia Total as N	mg/L	0495	WL	03/19/2008	0001	4.6	-	5.6	0.96			#	0.1	
Ammonia Total as N	mg/L	0557	WL	03/18/2008	0001	36	-	36	690			#	20	
Ammonia Total as N	mg/L	0558	WL	03/18/2008	0001	36	-	36	2000			#	50	
Ammonia Total as N	mg/L	0559	WL	03/18/2008	0001	18	-	18	360			#	20	
Ammonia Total as N	mg/L	0560	WL	03/18/2008	0001	36	-	36	2400			#	50	
Ammonia Total as N	mg/L	0561	WL	03/18/2008	0001	55	-	55	1000			#	20	
Ammonia Total as N	mg/L	0562	WL	03/19/2008	0001	1.3	-	2.3	12			#	0.5	
Ammonia Total as N	mg/L	0563	WL	03/19/2008	0001	4.6	-	5.6	90			#	20	
Ammonia Total as N	mg/L	0597	WL	03/19/2008	0001	9.3	-	10.3	77			#	20	
Ammonia Total as N	mg/L	0606	WL	03/19/2008	0001	9.3	-	10.3	500			#	20	
Ammonia Total as N	mg/L	SMI-PW01	WL	03/20/2008	0001	36	-	36	430			#	20	
Ammonia Total as N	mg/L	SMI-PZ1M	WL	03/20/2008	0001	55	-	55	980			#	20	

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 11/7/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	SMI-PZ1S	WL	03/20/2008	0001	18	-	18	390			#	20	
Bromide	mg/L	0216	SL	03/19/2008	0001	0.08	-	0.25	0.2	U	J	#	0.2	
Bromide	mg/L	0243	SL	03/19/2008	0001	0.25	-	0.25	0.2	U	J	#	0.2	
Bromide	mg/L	0403	WL	03/18/2008	0001	18	-	18	4	U		#	4	
Bromide	mg/L	0405	WL	03/19/2008	0001	18	-	18	2	U		#	2	
Bromide	mg/L	0407	WL	03/18/2008	0001	17	-	17	2	U		#	2	
Bromide	mg/L	0474	WL	03/19/2008	0001	10.3	-	19.7	4	U		#	4	
Bromide	mg/L	0480	WL	03/18/2008	0001	18	-	18	4	U		#	4	
Bromide	mg/L	0482	WL	03/18/2008	0001	55	-	55	20	U		#	20	
Bromide	mg/L	0483	WL	03/18/2008	0001	18	-	18	4	U		#	4	
Bromide	mg/L	0485	WL	03/18/2008	0001	55	-	55	20	U		#	20	
Bromide	mg/L	0488	WL	03/19/2008	0001	36	-	36	4	U		#	4	
Bromide	mg/L	0488	WL	03/19/2008	0002	36	-	36	4	U		#	4	
Bromide	mg/L	0493	WL	03/19/2008	0001	55	-	55	10	U		#	10	
Bromide	mg/L	0495	WL	03/19/2008	0001	4.6	-	5.6	1	U		#	1	
Bromide	mg/L	0557	WL	03/18/2008	0001	36	-	36	4	U		#	4	
Bromide	mg/L	0558	WL	03/18/2008	0001	36	-	36	10	U		#	10	
Bromide	mg/L	0559	WL	03/18/2008	0001	18	-	18	4	U		#	4	
Bromide	mg/L	0560	WL	03/18/2008	0001	36	-	36	20	U		#	20	
Bromide	mg/L	0561	WL	03/18/2008	0001	55	-	55	40	U		#	40	
Bromide	mg/L	0562	WL	03/19/2008	0001	1.3	-	2.3	1	U		#	1	
Bromide	mg/L	0563	WL	03/19/2008	0001	4.6	-	5.6	1	U		#	1	
Bromide	mg/L	0597	WL	03/19/2008	0001	9.3	-	10.3	1	U		#	1	
Bromide	mg/L	0606	WL	03/19/2008	0001	9.3	-	10.3	4	U		#	4	
Bromide	mg/L	SMI-PW01	WL	03/20/2008	0001	36	-	36	2	U		#	2	
Bromide	mg/L	SMI-	WL	03/20/2008	0001	55	-	55	4	U		#	4	

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 11/7/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
PZ1M														
Bromide	mg/L	SMI-PZ1S	WL	03/20/2008	0001	18	-	18	4	U		#	4	
Calcium	mg/L	0216	SL	03/19/2008	0001	0.08	-	0.25	84		J	#	0.033	
Calcium	mg/L	0243	SL	03/19/2008	0001	0.25	-	0.25	81		J	#	0.033	
Calcium	mg/L	0405	WL	03/19/2008	0001	18	-	18	420			#	0.17	
Calcium	mg/L	0474	WL	03/19/2008	0001	10.3	-	19.7	470			#	0.17	
Calcium	mg/L	0480	WL	03/18/2008	0001	18	-	18	490			#	0.33	
Calcium	mg/L	0482	WL	03/18/2008	0001	55	-	55	1400			#	1.7	
Calcium	mg/L	0483	WL	03/18/2008	0001	18	-	18	530			#	0.33	
Calcium	mg/L	0485	WL	03/18/2008	0001	55	-	55	1400			#	1.7	
Calcium	mg/L	0488	WL	03/19/2008	0001	36	-	36	430			#	0.17	
Calcium	mg/L	0488	WL	03/19/2008	0002	36	-	36	420			#	0.17	
Calcium	mg/L	0493	WL	03/19/2008	0001	55	-	55	470			#	0.83	
Calcium	mg/L	0495	WL	03/19/2008	0001	4.6	-	5.6	470			#	0.066	
Calcium	mg/L	0557	WL	03/18/2008	0001	36	-	36	490			#	0.33	
Calcium	mg/L	0558	WL	03/18/2008	0001	36	-	36	650			#	0.83	
Calcium	mg/L	0559	WL	03/18/2008	0001	18	-	18	430			#	0.17	
Calcium	mg/L	0560	WL	03/18/2008	0001	36	-	36	960			#	1.7	
Calcium	mg/L	0561	WL	03/18/2008	0001	55	-	55	1400			#	1.7	
Calcium	mg/L	0562	WL	03/19/2008	0001	1.3	-	2.3	350			#	0.066	
Calcium	mg/L	0563	WL	03/19/2008	0001	4.6	-	5.6	110			#	0.066	
Calcium	mg/L	0597	WL	03/19/2008	0001	9.3	-	10.3	360			#	0.066	
Calcium	mg/L	0606	WL	03/19/2008	0001	9.3	-	10.3	280			#	0.17	
Calcium	mg/L	SMI-PW01	WL	03/20/2008	0001	36	-	36	450			#	0.17	
Calcium	mg/L	SMI-PZ1M	WL	03/20/2008	0001	55	-	55	430			#	0.33	

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 11/7/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Calcium	mg/L	SMI-PZ1S	WL	03/20/2008	0001	18	-	18	420			#	0.17	
Chloride	mg/L	0216	SL	03/19/2008	0001	0.08	-	0.25	110		J	#	4	
Chloride	mg/L	0243	SL	03/19/2008	0001	0.25	-	0.25	100		J	#	4	
Chloride	mg/L	0403	WL	03/18/2008	0001	18	-	18	1800		J	#	40	
Chloride	mg/L	0405	WL	03/19/2008	0001	18	-	18	860		J	#	40	
Chloride	mg/L	0407	WL	03/18/2008	0001	17	-	17	2700		J	#	40	
Chloride	mg/L	0474	WL	03/19/2008	0001	10.3	-	19.7	2800		J	#	40	
Chloride	mg/L	0480	WL	03/18/2008	0001	18	-	18	4500		J	#	100	
Chloride	mg/L	0482	WL	03/18/2008	0001	55	-	55	43000		J	#	1000	
Chloride	mg/L	0483	WL	03/18/2008	0001	18	-	18	4200		J	#	100	
Chloride	mg/L	0485	WL	03/18/2008	0001	55	-	55	50000		J	#	1000	
Chloride	mg/L	0488	WL	03/19/2008	0001	36	-	36	1400		J	#	40	
Chloride	mg/L	0488	WL	03/19/2008	0002	36	-	36	1500		J	#	40	
Chloride	mg/L	0493	WL	03/19/2008	0001	55	-	55	5900		J	#	200	
Chloride	mg/L	0495	WL	03/19/2008	0001	4.6	-	5.6	430		J	#	20	
Chloride	mg/L	0557	WL	03/18/2008	0001	36	-	36	4600		J	#	100	
Chloride	mg/L	0558	WL	03/18/2008	0001	36	-	36	15000		J	#	200	
Chloride	mg/L	0559	WL	03/18/2008	0001	18	-	18	1600		J	#	40	
Chloride	mg/L	0560	WL	03/18/2008	0001	36	-	36	32000		J	#	1000	
Chloride	mg/L	0561	WL	03/18/2008	0001	55	-	55	47000		J	#	1000	
Chloride	mg/L	0562	WL	03/19/2008	0001	1.3	-	2.3	470		J	#	10	
Chloride	mg/L	0563	WL	03/19/2008	0001	4.6	-	5.6	520		J	#	10	
Chloride	mg/L	0597	WL	03/19/2008	0001	9.3	-	10.3	420		J	#	20	
Chloride	mg/L	0606	WL	03/19/2008	0001	9.3	-	10.3	3000		J	#	40	
Chloride	mg/L	SMI-PW01	WL	03/20/2008	0001	36	-	36	990		J	#	40	
Chloride	mg/L	SMI-	WL	03/20/2008	0001	55	-	55	3000		J	#	40	

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 11/7/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
PZ1M														
Chloride	mg/L	SMI-PZ1S	WL	03/20/2008	0001	18	-	18	1100		J	#	40	
Copper	mg/L	0561	WL	03/18/2008	0001	55	-	55	0.056	U	J	#	0.056	
Dissolved Oxygen	mg/L	0216	SL	03/19/2008	0001	0.08	-	0.25	13.58			#		
Dissolved Oxygen	mg/L	0243	SL	03/19/2008	0001	0.25	-	0.25	12.77			#		
Dissolved Oxygen	mg/L	0403	WL	03/18/2008	0001	18	-	18	0.36			#		
Dissolved Oxygen	mg/L	0405	WL	03/19/2008	0001	18	-	18	1.52			#		
Dissolved Oxygen	mg/L	0407	WL	03/18/2008	0001	17	-	17	0.42			#		
Dissolved Oxygen	mg/L	0474	WL	03/19/2008	0001	10.3	-	19.7	2.62			#		
Dissolved Oxygen	mg/L	0480	WL	03/18/2008	0001	18	-	18	0.49			#		
Dissolved Oxygen	mg/L	0482	WL	03/18/2008	0001	55	-	55	0.25			#		
Dissolved Oxygen	mg/L	0483	WL	03/18/2008	0001	18	-	18	0.49			#		
Dissolved Oxygen	mg/L	0485	WL	03/18/2008	0001	55	-	55	0.23			#		
Dissolved Oxygen	mg/L	0488	WL	03/19/2008	0001	36	-	36	0.88			#		
Dissolved Oxygen	mg/L	0493	WL	03/19/2008	0001	55	-	55	0.37			#		
Dissolved Oxygen	mg/L	0495	WL	03/19/2008	0001	4.6	-	5.6	6.17			#		
Dissolved Oxygen	mg/L	0557	WL	03/18/2008	0001	36	-	36	0.6			#		
Dissolved Oxygen	mg/L	0558	WL	03/18/2008	0001	36	-	36	0.41			#		
Dissolved Oxygen	mg/L	0559	WL	03/18/2008	0001	18	-	18	0.38			#		
Dissolved Oxygen	mg/L	0560	WL	03/18/2008	0001	36	-	36	0.21			#		
Dissolved Oxygen	mg/L	0561	WL	03/18/2008	0001	55	-	55	0.15			#		
Dissolved Oxygen	mg/L	0562	WL	03/19/2008	0001	1.3	-	2.3	6.2			#		
Dissolved Oxygen	mg/L	0563	WL	03/19/2008	0001	4.6	-	5.6	3.79			#		
Dissolved Oxygen	mg/L	0597	WL	03/19/2008	0001	9.3	-	10.3	4.88			#		
Dissolved Oxygen	mg/L	0606	WL	03/19/2008	0001	9.3	-	10.3	1.02			#		
Dissolved Oxygen	mg/L	SMI-PW01	WL	03/20/2008	0001	36	-	36	0.5			#		

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 11/7/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	SMI-PZ1M	WL	03/20/2008	0001	55	-	55	0.3			#		
Dissolved Oxygen	mg/L	SMI-PZ1S	WL	03/20/2008	0001	18	-	18	0.56			#		
Magnesium	mg/L	0216	SL	03/19/2008	0001	0.08	-	0.25	28		J	#	0.0091	
Magnesium	mg/L	0243	SL	03/19/2008	0001	0.25	-	0.25	27		J	#	0.0091	
Magnesium	mg/L	0405	WL	03/19/2008	0001	18	-	18	430			#	0.045	
Magnesium	mg/L	0474	WL	03/19/2008	0001	10.3	-	19.7	510			#	0.045	
Magnesium	mg/L	0480	WL	03/18/2008	0001	18	-	18	630			#	0.091	
Magnesium	mg/L	0482	WL	03/18/2008	0001	55	-	55	650			#	0.45	
Magnesium	mg/L	0483	WL	03/18/2008	0001	18	-	18	590			#	0.091	
Magnesium	mg/L	0485	WL	03/18/2008	0001	55	-	55	630			#	0.45	
Magnesium	mg/L	0488	WL	03/19/2008	0001	36	-	36	560			#	0.045	
Magnesium	mg/L	0488	WL	03/19/2008	0002	36	-	36	560			#	0.045	
Magnesium	mg/L	0493	WL	03/19/2008	0001	55	-	55	1200			#	0.23	
Magnesium	mg/L	0495	WL	03/19/2008	0001	4.6	-	5.6	300			#	0.018	
Magnesium	mg/L	0557	WL	03/18/2008	0001	36	-	36	600			#	0.091	
Magnesium	mg/L	0558	WL	03/18/2008	0001	36	-	36	740			#	0.23	
Magnesium	mg/L	0559	WL	03/18/2008	0001	18	-	18	500			#	0.045	
Magnesium	mg/L	0560	WL	03/18/2008	0001	36	-	36	920			#	0.45	
Magnesium	mg/L	0561	WL	03/18/2008	0001	55	-	55	660			#	0.45	
Magnesium	mg/L	0562	WL	03/19/2008	0001	1.3	-	2.3	110			#	0.018	
Magnesium	mg/L	0563	WL	03/19/2008	0001	4.6	-	5.6	83			#	0.018	
Magnesium	mg/L	0597	WL	03/19/2008	0001	9.3	-	10.3	250			#	0.018	
Magnesium	mg/L	0606	WL	03/19/2008	0001	9.3	-	10.3	300			#	0.045	
Magnesium	mg/L	SMI-PW01	WL	03/20/2008	0001	36	-	36	490			#	0.045	
Magnesium	mg/L	SMI-PZ1M	WL	03/20/2008	0001	55	-	55	830			#	0.091	



**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 11/7/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Magnesium	mg/L	SMI-PZ1S	WL	03/20/2008	0001	18	-	18	460			#	0.045	
Manganese	mg/L	0216	SL	03/19/2008	0001	0.08	-	0.25	0.039		J	#	0.00015	
Manganese	mg/L	0243	SL	03/19/2008	0001	0.25	-	0.25	0.016		J	#	0.00015	
Manganese	mg/L	0403	WL	03/18/2008	0001	18	-	18	4.6			#	0.00076	
Manganese	mg/L	0405	WL	03/19/2008	0001	18	-	18	5			#	0.00076	
Manganese	mg/L	0407	WL	03/18/2008	0001	17	-	17	3.6			#	0.00076	
Manganese	mg/L	0474	WL	03/19/2008	0001	10.3	-	19.7	3.7			#	0.00076	
Manganese	mg/L	0480	WL	03/18/2008	0001	18	-	18	5.1			#	0.0015	
Manganese	mg/L	0482	WL	03/18/2008	0001	55	-	55	7.1			#	0.0076	
Manganese	mg/L	0483	WL	03/18/2008	0001	18	-	18	5.3			#	0.0015	
Manganese	mg/L	0485	WL	03/18/2008	0001	55	-	55	6.7			#	0.0076	
Manganese	mg/L	0488	WL	03/19/2008	0001	36	-	36	6			#	0.00076	
Manganese	mg/L	0488	WL	03/19/2008	0002	36	-	36	6			#	0.00076	
Manganese	mg/L	0493	WL	03/19/2008	0001	55	-	55	9.4			#	0.0038	
Manganese	mg/L	0495	WL	03/19/2008	0001	4.6	-	5.6	1.5			#	0.00031	
Manganese	mg/L	0557	WL	03/18/2008	0001	36	-	36	5.1			#	0.0015	
Manganese	mg/L	0558	WL	03/18/2008	0001	36	-	36	7.8			#	0.0038	
Manganese	mg/L	0559	WL	03/18/2008	0001	18	-	18	4.3			#	0.00076	
Manganese	mg/L	0560	WL	03/18/2008	0001	36	-	36	9.7			#	0.0076	
Manganese	mg/L	0561	WL	03/18/2008	0001	55	-	55	7.9			#	0.0076	
Manganese	mg/L	0562	WL	03/19/2008	0001	1.3	-	2.3	3.1			#	0.00031	
Manganese	mg/L	0563	WL	03/19/2008	0001	4.6	-	5.6	0.75			#	0.00031	
Manganese	mg/L	0597	WL	03/19/2008	0001	9.3	-	10.3	2.6			#	0.00031	
Manganese	mg/L	0606	WL	03/19/2008	0001	9.3	-	10.3	1.4			#	0.00076	
Manganese	mg/L	SMI-PW01	WL	03/20/2008	0001	36	-	36	5.5			#	0.00076	
Manganese	mg/L	SMI-	WL	03/20/2008	0001	55	-	55	7.5			#	0.0015	

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
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Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
PZ1M														
Manganese	mg/L	SMI-PZ1S	WL	03/20/2008	0001	18	-	18	5.1			#	0.00076	
Oxidation Reduction Potential	mV	0216	SL	03/19/2008	0001	0.08	-	0.25	13			#		
Oxidation Reduction Potential	mV	0243	SL	03/19/2008	0001	0.25	-	0.25	3			#		
Oxidation Reduction Potential	mV	0403	WL	03/18/2008	0001	18	-	18	80			#		
Oxidation Reduction Potential	mV	0405	WL	03/19/2008	0001	18	-	18	37			#		
Oxidation Reduction Potential	mV	0407	WL	03/18/2008	0001	17	-	17	83			#		
Oxidation Reduction Potential	mV	0474	WL	03/19/2008	0001	10.3	-	19.7	47			#		
Oxidation Reduction Potential	mV	0480	WL	03/18/2008	0001	18	-	18	71			#		
Oxidation Reduction Potential	mV	0482	WL	03/18/2008	0001	55	-	55	47			#		
Oxidation Reduction Potential	mV	0483	WL	03/18/2008	0001	18	-	18	85			#		
Oxidation Reduction Potential	mV	0485	WL	03/18/2008	0001	55	-	55	250			#		
Oxidation Reduction Potential	mV	0488	WL	03/19/2008	0001	36	-	36	53			#		
Oxidation Reduction Potential	mV	0493	WL	03/19/2008	0001	55	-	55	31			#		
Oxidation Reduction Potential	mV	0495	WL	03/19/2008	0001	4.6	-	5.6	30			#		
Oxidation Reduction Potential	mV	0557	WL	03/18/2008	0001	36	-	36	81			#		
Oxidation Reduction Potential	mV	0558	WL	03/18/2008	0001	36	-	36	223			#		
Oxidation Reduction Potential	mV	0559	WL	03/18/2008	0001	18	-	18	188			#		
Oxidation Reduction Potential	mV	0560	WL	03/18/2008	0001	36	-	36	59			#		
Oxidation Reduction Potential	mV	0561	WL	03/18/2008	0001	55	-	55	-29			#		
Oxidation Reduction Potential	mV	0562	WL	03/19/2008	0001	1.3	-	2.3	15			#		
Oxidation Reduction Potential	mV	0563	WL	03/19/2008	0001	4.6	-	5.6	111			#		

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
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Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	0597	WL	03/19/2008	0001	9.3	-	10.3	43			#		
Oxidation Reduction Potential	mV	0606	WL	03/19/2008	0001	9.3	-	10.3	68			#		
Oxidation Reduction Potential	mV	SMI-PW01	WL	03/20/2008	0001	36	-	36	113			#		
Oxidation Reduction Potential	mV	SMI-PZ1M	WL	03/20/2008	0001	55	-	55	132			#		
Oxidation Reduction Potential	mV	SMI-PZ1S	WL	03/20/2008	0001	18	-	18	125			#		
pH	s.u.	0216	SL	03/19/2008	0001	0.08	-	0.25	8.01			#		
pH	s.u.	0243	SL	03/19/2008	0001	0.25	-	0.25	8.3			#		
pH	s.u.	0403	WL	03/18/2008	0001	18	-	18	6.44			#		
pH	s.u.	0405	WL	03/19/2008	0001	18	-	18	6.81			#		
pH	s.u.	0407	WL	03/18/2008	0001	17	-	17	6.74			#		
pH	s.u.	0474	WL	03/19/2008	0001	10.3	-	19.7	7			#		
pH	s.u.	0480	WL	03/18/2008	0001	18	-	18	6.73			#		
pH	s.u.	0482	WL	03/18/2008	0001	55	-	55	6.62			#		
pH	s.u.	0483	WL	03/18/2008	0001	18	-	18	6.66			#		
pH	s.u.	0485	WL	03/18/2008	0001	55	-	55	6.43			#		
pH	s.u.	0488	WL	03/19/2008	0001	36	-	36	6.85			#		
pH	s.u.	0493	WL	03/19/2008	0001	55	-	55	6.66			#		
pH	s.u.	0495	WL	03/19/2008	0001	4.6	-	5.6	7.21			#		
pH	s.u.	0557	WL	03/18/2008	0001	36	-	36	6.78			#		
pH	s.u.	0558	WL	03/18/2008	0001	36	-	36	6.51			#		
pH	s.u.	0559	WL	03/18/2008	0001	18	-	18	6.53			#		
pH	s.u.	0560	WL	03/18/2008	0001	36	-	36	6.37			#		
pH	s.u.	0561	WL	03/18/2008	0001	55	-	55	6.43			#		
pH	s.u.	0562	WL	03/19/2008	0001	1.3	-	2.3	7.26			#		
pH	s.u.	0563	WL	03/19/2008	0001	4.6	-	5.6	7.92			#		

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
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Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
pH	s.u.	0597	WL	03/19/2008	0001	9.3	-	10.3	7.24			#		
pH	s.u.	0606	WL	03/19/2008	0001	9.3	-	10.3	7.64			#		
pH	s.u.	SMI-PW01	WL	03/20/2008	0001	36	-	36	6.77			#		
pH	s.u.	SMI-PZ1M	WL	03/20/2008	0001	55	-	55	6.95			#		
pH	s.u.	SMI-PZ1S	WL	03/20/2008	0001	18	-	18	6.83			#		
Potassium	mg/L	0216	SL	03/19/2008	0001	0.08	-	0.25	5.9	EN	J	#	0.087	
Potassium	mg/L	0243	SL	03/19/2008	0001	0.25	-	0.25	5.4	EN	J	#	0.087	
Potassium	mg/L	0405	WL	03/19/2008	0001	18	-	18	82		J	#	0.43	
Potassium	mg/L	0474	WL	03/19/2008	0001	10.3	-	19.7	180		J	#	0.43	
Potassium	mg/L	0480	WL	03/18/2008	0001	18	-	18	220		J	#	0.87	
Potassium	mg/L	0482	WL	03/18/2008	0001	55	-	55	1100		J	#	4.3	
Potassium	mg/L	0483	WL	03/18/2008	0001	18	-	18	260		J	#	0.87	
Potassium	mg/L	0485	WL	03/18/2008	0001	55	-	55	1100		J	#	4.3	
Potassium	mg/L	0488	WL	03/19/2008	0001	36	-	36	240		J	#	0.43	
Potassium	mg/L	0488	WL	03/19/2008	0002	36	-	36	230		J	#	0.43	
Potassium	mg/L	0493	WL	03/19/2008	0001	55	-	55	350		J	#	2.2	
Potassium	mg/L	0495	WL	03/19/2008	0001	4.6	-	5.6	64		J	#	0.17	
Potassium	mg/L	0557	WL	03/18/2008	0001	36	-	36	230		J	#	0.87	
Potassium	mg/L	0558	WL	03/18/2008	0001	36	-	36	920		J	#	2.2	
Potassium	mg/L	0559	WL	03/18/2008	0001	18	-	18	150		J	#	0.43	
Potassium	mg/L	0560	WL	03/18/2008	0001	36	-	36	1200		J	#	4.3	
Potassium	mg/L	0561	WL	03/18/2008	0001	55	-	55	1200		J	#	4.3	
Potassium	mg/L	0562	WL	03/19/2008	0001	1.3	-	2.3	19		J	#	0.17	
Potassium	mg/L	0563	WL	03/19/2008	0001	4.6	-	5.6	64		J	#	0.17	
Potassium	mg/L	0597	WL	03/19/2008	0001	9.3	-	10.3	44		J	#	0.17	

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
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Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Potassium	mg/L	0606	WL	03/19/2008	0001	9.3	-	10.3	200		J	#	0.43	
Potassium	mg/L	SMI-PW01	WL	03/20/2008	0001	36	-	36	120		J	#	0.43	
Potassium	mg/L	SMI-PZ1M	WL	03/20/2008	0001	55	-	55	320		J	#	0.87	
Potassium	mg/L	SMI-PZ1S	WL	03/20/2008	0001	18	-	18	100		J	#	0.43	
Selenium	mg/L	0405	WL	03/19/2008	0001	18	-	18	0.014			#	9.5E-005	
Selenium	mg/L	0495	WL	03/19/2008	0001	4.6	-	5.6	0.011			#	9.5E-005	
Selenium	mg/L	0597	WL	03/19/2008	0001	9.3	-	10.3	0.0077			#	9.5E-005	
Selenium	mg/L	0606	WL	03/19/2008	0001	9.3	-	10.3	0.0045			#	9.5E-005	
Sodium	mg/L	0216	SL	03/19/2008	0001	0.08	-	0.25	110		J	#	0.0054	
Sodium	mg/L	0243	SL	03/19/2008	0001	0.25	-	0.25	98		J	#	0.0054	
Sodium	mg/L	0405	WL	03/19/2008	0001	18	-	18	1500			#	0.27	
Sodium	mg/L	0474	WL	03/19/2008	0001	10.3	-	19.7	2600			#	0.27	
Sodium	mg/L	0480	WL	03/18/2008	0001	18	-	18	3800			#	0.27	
Sodium	mg/L	0482	WL	03/18/2008	0001	55	-	55	25000			#	2.7	
Sodium	mg/L	0483	WL	03/18/2008	0001	18	-	18	3400			#	0.27	
Sodium	mg/L	0485	WL	03/18/2008	0001	55	-	55	26000			#	2.7	
Sodium	mg/L	0488	WL	03/19/2008	0001	36	-	36	2400			#	0.27	
Sodium	mg/L	0488	WL	03/19/2008	0002	36	-	36	2500			#	0.27	
Sodium	mg/L	0493	WL	03/19/2008	0001	55	-	55	6100			#	0.13	
Sodium	mg/L	0495	WL	03/19/2008	0001	4.6	-	5.6	770			#	0.27	
Sodium	mg/L	0557	WL	03/18/2008	0001	36	-	36	3800			#	0.27	
Sodium	mg/L	0558	WL	03/18/2008	0001	36	-	36	9500			#	0.27	
Sodium	mg/L	0559	WL	03/18/2008	0001	18	-	18	2000			#	0.27	
Sodium	mg/L	0560	WL	03/18/2008	0001	36	-	36	17000			#	0.54	
Sodium	mg/L	0561	WL	03/18/2008	0001	55	-	55	24000			#	2.7	

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
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Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Sodium	mg/L	0562	WL	03/19/2008	0001	1.3	-	2.3	500			#	0.011	
Sodium	mg/L	0563	WL	03/19/2008	0001	4.6	-	5.6	610			#	0.054	
Sodium	mg/L	0597	WL	03/19/2008	0001	9.3	-	10.3	750			#	0.054	
Sodium	mg/L	0606	WL	03/19/2008	0001	9.3	-	10.3	2400			#	0.27	
Sodium	mg/L	SMI-PW01	WL	03/20/2008	0001	36	-	36	1800			#	0.27	
Sodium	mg/L	SMI-PZ1M	WL	03/20/2008	0001	55	-	55	4100			#	0.27	
Sodium	mg/L	SMI-PZ1S	WL	03/20/2008	0001	18	-	18	2000			#	0.27	
Specific Conductance	umhos /cm	0216	SL	03/19/2008	0001	0.08	-	0.25	1225			#		
Specific Conductance	umhos /cm	0243	SL	03/19/2008	0001	0.25	-	0.25	1121			#		
Specific Conductance	umhos /cm	0403	WL	03/18/2008	0001	18	-	18	15856			#		
Specific Conductance	umhos /cm	0405	WL	03/19/2008	0001	18	-	18	11214			#		
Specific Conductance	umhos /cm	0407	WL	03/18/2008	0001	17	-	17	12268			#		
Specific Conductance	umhos /cm	0474	WL	03/19/2008	0001	10.3	-	19.7	17276			#		
Specific Conductance	umhos /cm	0480	WL	03/18/2008	0001	18	-	18	23217			#		
Specific Conductance	umhos /cm	0482	WL	03/18/2008	0001	55	-	55	104793			#		
Specific Conductance	umhos /cm	0483	WL	03/18/2008	0001	18	-	18	22007			#		
Specific Conductance	umhos /cm	0485	WL	03/18/2008	0001	55	-	55	106387			#		
Specific Conductance	umhos /cm	0488	WL	03/19/2008	0001	36	-	36	17719			#		
Specific Conductance	umhos /cm	0493	WL	03/19/2008	0001	55	-	55	34419			#		
Specific Conductance	umhos /cm	0495	WL	03/19/2008	0001	4.6	-	5.6	6230			#		
Specific Conductance	umhos /cm	0557	WL	03/18/2008	0001	36	-	36	22341			#		
Specific Conductance	umhos /cm	0558	WL	03/18/2008	0001	36	-	36	53490			#		

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
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Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Specific Conductance	umhos /cm	0559	WL	03/18/2008	0001	18	-	18	13886			#		
Specific Conductance	umhos /cm	0560	WL	03/18/2008	0001	36	-	36	84701			#		
Specific Conductance	umhos /cm	0561	WL	03/18/2008	0001	55	-	55	105874			#		
Specific Conductance	umhos /cm	0562	WL	03/19/2008	0001	1.3	-	2.3	4145			#		
Specific Conductance	umhos /cm	0563	WL	03/19/2008	0001	4.6	-	5.6	3575			#		
Specific Conductance	umhos /cm	0597	WL	03/19/2008	0001	9.3	-	10.3	6180			#		
Specific Conductance	umhos /cm	0606	WL	03/19/2008	0001	9.3	-	10.3	15947			#		
Specific Conductance	umhos /cm	SMI-PW01	WL	03/20/2008	0001	36	-	36	12918			#		
Specific Conductance	umhos /cm	SMI-PZ1M	WL	03/20/2008	0001	55	-	55	24104			#		
Specific Conductance	umhos /cm	SMI-PZ1S	WL	03/20/2008	0001	18	-	18	13289			#		
Sulfate	mg/L	0216	SL	03/19/2008	0001	0.08	-	0.25	230		J	#	10	
Sulfate	mg/L	0243	SL	03/19/2008	0001	0.25	-	0.25	210		J	#	10	
Sulfate	mg/L	0403	WL	03/18/2008	0001	18	-	18	6800		J	#	100	
Sulfate	mg/L	0405	WL	03/19/2008	0001	18	-	18	5000		J	#	100	
Sulfate	mg/L	0407	WL	03/18/2008	0001	17	-	17	3000		J	#	100	
Sulfate	mg/L	0474	WL	03/19/2008	0001	10.3	-	19.7	6900		J	#	100	
Sulfate	mg/L	0480	WL	03/18/2008	0001	18	-	18	8400		J	#	100	
Sulfate	mg/L	0482	WL	03/18/2008	0001	55	-	55	5300		J	#	50	
Sulfate	mg/L	0483	WL	03/18/2008	0001	18	-	18	6600		J	#	100	
Sulfate	mg/L	0485	WL	03/18/2008	0001	55	-	55	5500		J	#	50	
Sulfate	mg/L	0488	WL	03/19/2008	0001	36	-	36	8400		J	#	100	
Sulfate	mg/L	0488	WL	03/19/2008	0002	36	-	36	8500		J	#	100	
Sulfate	mg/L	0493	WL	03/19/2008	0001	55	-	55	14000		J	#	500	
Sulfate	mg/L	0495	WL	03/19/2008	0001	4.6	-	5.6	2700		J	#	50	

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 11/7/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Sulfate	mg/L	0557	WL	03/18/2008	0001	36	-	36	8100		J	#	100	
Sulfate	mg/L	0558	WL	03/18/2008	0001	36	-	36	8700		J	#	100	
Sulfate	mg/L	0559	WL	03/18/2008	0001	18	-	18	6800		J	#	100	
Sulfate	mg/L	0560	WL	03/18/2008	0001	36	-	36	8300		J	#	50	
Sulfate	mg/L	0561	WL	03/18/2008	0001	55	-	55	5600		J	#	100	
Sulfate	mg/L	0562	WL	03/19/2008	0001	1.3	-	2.3	1300		J	#	25	
Sulfate	mg/L	0563	WL	03/19/2008	0001	4.6	-	5.6	1500		J	#	25	
Sulfate	mg/L	0597	WL	03/19/2008	0001	9.3	-	10.3	2700		J	#	50	
Sulfate	mg/L	0606	WL	03/19/2008	0001	9.3	-	10.3	4700		J	#	100	
Sulfate	mg/L	SMI-PW01	WL	03/20/2008	0001	36	-	36	6000		J	#	100	
Sulfate	mg/L	SMI-PZ1M	WL	03/20/2008	0001	55	-	55	12000		J	#	100	
Sulfate	mg/L	SMI-PZ1S	WL	03/20/2008	0001	18	-	18	6000		J	#	100	
Temperature	C	0216	SL	03/19/2008	0001	0.08	-	0.25	10.29			#		
Temperature	C	0243	SL	03/19/2008	0001	0.25	-	0.25	14.92			#		
Temperature	C	0403	WL	03/18/2008	0001	18	-	18	14.65			#		
Temperature	C	0405	WL	03/19/2008	0001	18	-	18	16.02			#		
Temperature	C	0407	WL	03/18/2008	0001	17	-	17	16.3			#		
Temperature	C	0474	WL	03/19/2008	0001	10.3	-	19.7	14.92			#		
Temperature	C	0480	WL	03/18/2008	0001	18	-	18	14.87			#		
Temperature	C	0482	WL	03/18/2008	0001	55	-	55	15.22			#		
Temperature	C	0483	WL	03/18/2008	0001	18	-	18	15.12			#		
Temperature	C	0485	WL	03/18/2008	0001	55	-	55	15.26			#		
Temperature	C	0488	WL	03/19/2008	0001	36	-	36	16.51			#		
Temperature	C	0493	WL	03/19/2008	0001	55	-	55	17.06			#		
Temperature	C	0495	WL	03/19/2008	0001	4.6	-	5.6	18.13			#		



**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 11/7/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Temperature	C	0557	WL	03/18/2008	0001	36	-	36	14.58			#		
Temperature	C	0558	WL	03/18/2008	0001	36	-	36	14.83			#		
Temperature	C	0559	WL	03/18/2008	0001	18	-	18	13.65			#		
Temperature	C	0560	WL	03/18/2008	0001	36	-	36	15.46			#		
Temperature	C	0561	WL	03/18/2008	0001	55	-	55	15.02			#		
Temperature	C	0562	WL	03/19/2008	0001	1.3	-	2.3	8.38			#		
Temperature	C	0563	WL	03/19/2008	0001	4.6	-	5.6	8.45			#		
Temperature	C	0597	WL	03/19/2008	0001	9.3	-	10.3	16.39			#		
Temperature	C	0606	WL	03/19/2008	0001	9.3	-	10.3	9.91			#		
Temperature	C	SMI-PW01	WL	03/20/2008	0001	36	-	36	14.87			#		
Temperature	C	SMI-PZ1M	WL	03/20/2008	0001	55	-	55	15.44			#		
Temperature	C	SMI-PZ1S	WL	03/20/2008	0001	18	-	18	14.9			#		
Total Dissolved Solids	mg/L	0216	SL	03/19/2008	0001	0.08	-	0.25	700		J	#	20	
Total Dissolved Solids	mg/L	0243	SL	03/19/2008	0001	0.25	-	0.25	660		J	#	20	
Total Dissolved Solids	mg/L	0403	WL	03/18/2008	0001	18	-	18	14000			#	400	
Total Dissolved Solids	mg/L	0405	WL	03/19/2008	0001	18	-	18	10000			#	200	
Total Dissolved Solids	mg/L	0407	WL	03/18/2008	0001	17	-	17	9200			#	200	
Total Dissolved Solids	mg/L	0474	WL	03/19/2008	0001	10.3	-	19.7	15000			#	400	
Total Dissolved Solids	mg/L	0480	WL	03/18/2008	0001	18	-	18	19000			#	400	
Total Dissolved Solids	mg/L	0482	WL	03/18/2008	0001	55	-	55	87000			#	2000	
Total Dissolved Solids	mg/L	0483	WL	03/18/2008	0001	18	-	18	18000			#	400	
Total Dissolved Solids	mg/L	0485	WL	03/18/2008	0001	55	-	55	88000			#	2000	
Total Dissolved Solids	mg/L	0488	WL	03/19/2008	0001	36	-	36	15000			#	200	
Total Dissolved Solids	mg/L	0488	WL	03/19/2008	0002	36	-	36	16000			#	400	
Total Dissolved Solids	mg/L	0493	WL	03/19/2008	0001	55	-	55	31000			#	1000	

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 11/7/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Total Dissolved Solids	mg/L	0495	WL	03/19/2008	0001	4.6	-	5.6	6100			#	80	
Total Dissolved Solids	mg/L	0557	WL	03/18/2008	0001	36	-	36	19000			#	400	
Total Dissolved Solids	mg/L	0558	WL	03/18/2008	0001	36	-	36	39000			#	8000	
Total Dissolved Solids	mg/L	0559	WL	03/18/2008	0001	18	-	18	12000			#	200	
Total Dissolved Solids	mg/L	0560	WL	03/18/2008	0001	36	-	36	64000			#	2000	
Total Dissolved Solids	mg/L	0561	WL	03/18/2008	0001	55	-	55	87000			#	2000	
Total Dissolved Solids	mg/L	0562	WL	03/19/2008	0001	1.3	-	2.3	3300			#	80	
Total Dissolved Solids	mg/L	0563	WL	03/19/2008	0001	4.6	-	5.6	3200			#	80	
Total Dissolved Solids	mg/L	0597	WL	03/19/2008	0001	9.3	-	10.3	5500			#	200	
Total Dissolved Solids	mg/L	0606	WL	03/19/2008	0001	9.3	-	10.3	12000			#	400	
Total Dissolved Solids	mg/L	SMI-PW01	WL	03/20/2008	0001	36	-	36	12000			#	200	
Total Dissolved Solids	mg/L	SMI-PZ1M	WL	03/20/2008	0001	55	-	55	23000			#	400	
Total Dissolved Solids	mg/L	SMI-PZ1S	WL	03/20/2008	0001	18	-	18	12000			#	200	
Turbidity	NTU	0216	SL	03/19/2008	0001	0.08	-	0.25	115			#		
Turbidity	NTU	0243	SL	03/19/2008	0001	0.25	-	0.25	2.45			#		
Turbidity	NTU	0403	WL	03/18/2008	0001	18	-	18	2.27			#		
Turbidity	NTU	0405	WL	03/19/2008	0001	18	-	18	2.94			#		
Turbidity	NTU	0407	WL	03/18/2008	0001	17	-	17	2.05			#		
Turbidity	NTU	0474	WL	03/19/2008	0001	10.3	-	19.7	21.3			#		
Turbidity	NTU	0480	WL	03/18/2008	0001	18	-	18	2.16			#		
Turbidity	NTU	0482	WL	03/18/2008	0001	55	-	55	6.27			#		
Turbidity	NTU	0483	WL	03/18/2008	0001	18	-	18	3.03			#		
Turbidity	NTU	0485	WL	03/18/2008	0001	55	-	55	5.44			#		
Turbidity	NTU	0488	WL	03/19/2008	0001	36	-	36	3.95			#		
Turbidity	NTU	0493	WL	03/19/2008	0001	55	-	55	9.31			#		

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 11/7/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Turbidity	NTU	0495	WL	03/19/2008	0001	4.6	-	5.6	43			#		
Turbidity	NTU	0557	WL	03/18/2008	0001	36	-	36	4.25			#		
Turbidity	NTU	0558	WL	03/18/2008	0001	36	-	36	2.86			#		
Turbidity	NTU	0559	WL	03/18/2008	0001	18	-	18	3.37			#		
Turbidity	NTU	0560	WL	03/18/2008	0001	36	-	36	2.7			#		
Turbidity	NTU	0561	WL	03/18/2008	0001	55	-	55	3.9			#		
Turbidity	NTU	0562	WL	03/19/2008	0001	1.3	-	2.3	206			#		
Turbidity	NTU	0563	WL	03/19/2008	0001	4.6	-	5.6	43.7			#		
Turbidity	NTU	0597	WL	03/19/2008	0001	9.3	-	10.3	27			#		
Turbidity	NTU	0606	WL	03/19/2008	0001	9.3	-	10.3	53.4			#		
Turbidity	NTU	SMI-PW01	WL	03/20/2008	0001	36	-	36	1.36			#		
Turbidity	NTU	SMI-PZ1M	WL	03/20/2008	0001	55	-	55	1.29			#		
Turbidity	NTU	SMI-PZ1S	WL	03/20/2008	0001	18	-	18	4.07			#		
Uranium	mg/L	0216	SL	03/19/2008	0001	0.08	-	0.25	0.018		J	#	5.9E-006	
Uranium	mg/L	0243	SL	03/19/2008	0001	0.25	-	0.25	0.012		J	#	5.9E-006	
Uranium	mg/L	0403	WL	03/18/2008	0001	18	-	18	2.6			#	0.0003	
Uranium	mg/L	0405	WL	03/19/2008	0001	18	-	18	1.9			#	0.0003	
Uranium	mg/L	0407	WL	03/18/2008	0001	17	-	17	0.88			#	0.0003	
Uranium	mg/L	0474	WL	03/19/2008	0001	10.3	-	19.7	2.7			#	0.0003	
Uranium	mg/L	0480	WL	03/18/2008	0001	18	-	18	3.1			#	0.0003	
Uranium	mg/L	0482	WL	03/18/2008	0001	55	-	55	0.61			#	5.9E-005	
Uranium	mg/L	0483	WL	03/18/2008	0001	18	-	18	2.9			#	0.0003	
Uranium	mg/L	0485	WL	03/18/2008	0001	55	-	55	0.56			#	5.9E-005	
Uranium	mg/L	0488	WL	03/19/2008	0001	36	-	36	2.2			#	0.0003	
Uranium	mg/L	0488	WL	03/19/2008	0002	36	-	36	2			#	0.0003	

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 11/7/2008**

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Uranium	mg/L	0493	WL	03/19/2008	0001	55	-	55	3.4			#	0.0003	
Uranium	mg/L	0495	WL	03/19/2008	0001	4.6	-	5.6	2.3			#	0.0003	
Uranium	mg/L	0557	WL	03/18/2008	0001	36	-	36	2.6			#	0.0003	
Uranium	mg/L	0558	WL	03/18/2008	0001	36	-	36	2.5			#	0.0003	
Uranium	mg/L	0559	WL	03/18/2008	0001	18	-	18	2.4			#	0.0003	
Uranium	mg/L	0560	WL	03/18/2008	0001	36	-	36	1.7			#	0.0003	
Uranium	mg/L	0561	WL	03/18/2008	0001	55	-	55	0.56			#	5.9E-005	
Uranium	mg/L	0562	WL	03/19/2008	0001	1.3	-	2.3	0.32			#	3.E-005	
Uranium	mg/L	0563	WL	03/19/2008	0001	4.6	-	5.6	0.4			#	0.0003	
Uranium	mg/L	0597	WL	03/19/2008	0001	9.3	-	10.3	1.3			#	0.0003	
Uranium	mg/L	0606	WL	03/19/2008	0001	9.3	-	10.3	1.2			#	0.0003	
Uranium	mg/L	SMI-PW01	WL	03/20/2008	0001	36	-	36	1.5			#	0.0003	
Uranium	mg/L	SMI-PZ1M	WL	03/20/2008	0001	55	-	55	2.9			#	0.0003	
Uranium	mg/L	SMI-PZ1S	WL	03/20/2008	0001	18	-	18	2.3			#	0.0003	

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

**LAB QUALIFIERS:**

- \* Replicate analysis not within control limits.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- C Pesticide result confirmed by GC-MS.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X,Y,Z Laboratory defined qualifier, see case narrative.

DATA QUALIFIERS:

F	Low flow sampling method used.	G	Possible grout contamination, pH > 9.	J	Estimated value.
L	Less than 3 bore volumes purged prior to sampling.	Q	Qualitative result due to sampling technique.	R	Unusable result.
U	Parameter analyzed for but was not detected.	X	Location is undefined.		

QA QUALIFIER:

# Validated according to quality assurance guidelines.

### **3.4 Water Level Data**

#### ***3.4.1 Monthly Sampling Event***

**STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 7/16/2008**

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0401	O	3969.6	03/11/2008		15.7	3953.9	
0471		3964.37	03/13/2008		12.42	3951.95	
0473		3964.66	03/13/2008		12.78	3951.88	
0477		3965.08	03/13/2008		13.21	3951.87	
0479		3964.67	03/13/2008		12.19	3952.48	
0484		3969.19	03/13/2008		16.1	3953.09	
0584		3969.13	03/11/2008		15.42	3953.71	
0587		3968.89	03/11/2008		15.83	3953.06	
0600		3968.77	03/11/2008		15.36	3953.41	
0683		3970.73	03/12/2008		16.33	3954.4	
0686		3968.85	03/12/2008		14.54	3954.31	
0687		3969.09	03/11/2008		14.71	3954.38	
0688		3968.66	03/11/2008		14.35	3954.31	
0689		3968.66	03/11/2008		14.48	3954.18	
0781		3968.56	03/11/2008		16.01	3952.55	
0782		3968.46	03/11/2008		16.43	3952.03	
0786		3968.14	03/11/2008		15.88	3952.26	
0787		3968.43	03/11/2008		16.45	3951.98	

FLOW CODES: B BACKGROUND C CROSS GRADIENT D DOWN GRADIENT O ON SITE  
 U UPGRADIENT

WATER LEVEL FLAGS: D Dry

### **3.4.2**   *Ground Water/Surface Water Interaction Investigation Sampling Event*



**STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 11/7/2008**

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0403	O	3968.95	03/18/2008		16.15	3952.8	
0405	O	3968.47	03/19/2008		14.13	3954.34	
0407	O	3969.09	03/18/2008		16.75	3952.34	
0474		3964.99	03/19/2008		13.02	3951.97	
0480		3968.65	03/18/2008		16.12	3952.53	
0482		3968.7	03/18/2008		16.59	3952.11	
0483		3968.9	03/18/2008		16.45	3952.45	
0485		3968.81	03/18/2008		16.51	3952.3	
0488		3968.48	03/19/2008		13.97	3954.51	
0493		3967.89	03/19/2008		13.55	3954.34	
0495		3959.89	03/19/2008		5.56	3954.33	
0557		3968.85	03/18/2008		15.33	3953.52	
0558		3968.79	03/18/2008		15.95	3952.84	
0559		3969.92	03/18/2008		17.37	3952.55	
0560		3968.77	03/18/2008		16.15	3952.62	
0561		3968.56	03/18/2008		16.24	3952.32	
0562		3955.37	03/19/2008		3.2	3952.17	
0563		3958.04	03/19/2008		5.66	3952.38	
0597		3959.11	03/19/2008		4.76	3954.35	
0606		3955.69	03/19/2008		3.05	3952.64	
SMI-PW01	O	3968.45	03/20/2008		13.82	3954.63	
SMI-PZ1M	O	3968.29	03/20/2008		13.75	3954.54	
SMI-PZ1S	O	3969.13	03/20/2008		14.59	3954.54	

FLOW CODES: B BACKGROUND C CROSS GRADIENT D DOWN GRADIENT O ON SITE  
 U UPGRADIENT

WATER LEVEL FLAGS: D Dry

### **3.5 Blanks Report**

All samples were collected using dedicated sampling equipment. As a result, no equipment blanks were required during the monthly sampling event. Only two samples were collected during the ground water/surface water investigation using nondedicated equipment, and an equipment blank was not collected.

**Attachment 1**

**Monthly Sampling Event Trip Report**



DATE: March 24, 2008

TO: K. Pill

FROM: E. Glowiak

SUBJECT: Trip Report

**Site:** Moab – Interim Action Well Field Monthly Sampling – March 2008

**Date of Sampling Event:** March 11-13, 2008

**Team Members:** Steve Back, Elizabeth Glowiak

**RIN Number Assigned:** All samples were assigned to RIN 0803009.

**Sample Shipment:** All samples were shipped in a cooler overnight UPS to Paragon Analytics, Inc. from Moab, Utah, on March 13, 2008 (Tracking No. 1Z5W1Y510197240682).

### March 2008 Configuration 1 Sampling

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**Number of Locations Sampled:** Four extraction wells (0471, 0473, 0477, and 0479) and one observation well (0484) were sampled during the March 2008 sampling event. Including one duplicate, a total of six samples were collected. A large number of the Configuration 1 observation wells, river bank well points, and one surface water location were sampled under RIN 0803010 in March 2008.

**Locations Not Sampled:** None

**Field Variance:** None.

**Quality Control Sample Cross Reference:** Following is the blind identification assigned to the quality control sample:

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
2492	0479	Duplicate from 18 ft bgs	Ground Water	NFC 443

**Location Specific Information – Configuration 1 Extraction Wells:** Extraction wells were sampled using dedicated submersible pumps.

Well No.	Date	Time	Water Level (ft btoc*)	Pump Intake (ft bgs)
0471	03/13/2008	09:19	12.42	18
0473	03/13/2008	09:29	12.78	18
0477	03/13/2008	09:38	13.21	18
0479	03/13/2008	09:48	12.19	23

\*Below top of casing.

**Location Specific Information – Observation Wells:** All observation wells were sampled using micro-purge techniques with a peristaltic pump and dedicated downhole and pump-head tubing. Sample depths and water levels for each observation well are listed below.

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0484	03/13/2008	10:08	16.10	28

### March 2008 Configuration 2 Sampling

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**Number of Locations Sampled:** Four observation wells (0401, 0584, 0587, and 0600) were sampled during the March 2008 sampling event.

**Locations Not Sampled:** None

**Field Variance:** None

**Location Specific Information – Observation Wells:** All observation wells were sampled using micro-purge techniques with a peristaltic pump and dedicated pump-head and downhole tubing. Sample depths and water levels for each observation well are listed below.

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0401	03/11/2008	13:59	15.70	18
0584	03/11/2008	11:18	15.42	18
0587	03/11/2008	13:37	15.33	18
0600	03/11/2008	10:57	15.36	28

### March 2008 Configuration 3 Sampling

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**Number of Locations Sampled:** Five observation wells (0683, 0686, 0687, 0688-39, and 0689-54), were sampled during the March 2008 sampling event. A total of five samples were collected.

**Locations Not Sampled:** None.

**Field Variance:** None

**Locations in Which Field Parameters Were Measured Only:** Parameters were measured at locations 0688 at 39 ft and 0689 at 46 ft.

Well No.	Date	Time	Depth (ft bgs)	Depth To Water (ft btoc)	Field Parameters					
					Temp (°C)	Spec Cond (µS/cm)	D.O. (mg/L)	pH	ORP	Turb. (NTUs)
0688	03/11/2008	14:44	31	14.37	15.65	15,354	0.39	6.72	122	0.46
0689	03/11/2008	15:40	46	14.52	15.36	22,976	0.46	6.97	114	6.11

**Location Specific Information – Observation Wells:** All observation wells were sampled using micro-purge techniques with a peristaltic pump and dedicated pump-head and downhole tubing. Sample depths and water levels for each observation well are listed below.

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0683	03/12/2008	09:44	16.33	27
0686	03/12/2008	09:16	14.54	18
0687	03/11/2008	14:58	14.71	28
0688-39	03/11/2008	14:26	14.35	39
0689-54	03/11/2008	15:24	14.48	54

#### March 2008 Configuration 4 Sampling

**Number of Locations Sampled:** Four observation wells (0781, 0782, 0786, and 0787) were sampled during the March 2008 sampling event.

**Field Variance:** None.

**Locations Not Sampled:** None

**Location Specific Information – Observation Wells:** All observation wells were sampled using micro-purge techniques with a peristaltic pump and dedicated pump-head and downhole tubing. Sample depths and water levels for each observation well are listed below.

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0781	03/11/2008	09:15	16.01	46
0782	03/11/2008	09:33	16.43	31
0786	03/11/2008	10:19	15.88	28
0787	03/11/2008	09:56	16.45	36

**Well Inspection Summary:** A well inspection was not conducted.

**Site Issues:** According to the USGS Cisco Gaging Station (Station No. 09180500), the mean daily Colorado River flows during this sampling event are provided below:

Date	Daily Mean Flow (cfs)
03/11/2008	4,150
03/12/2008	4,260
03/13/2008	4,520

**Equipment Issues:** None.

**Corrective Action Required/Taken:** None.

cc: J.D. Ritchey, P2S  
K. G. Pill, P2S  
E. M. Glowiak, P2S  
M. Mullis, S&K

## **Attachment 2**

### **Ground Water/Surface Water Interaction Investigation Sampling Event Trip Report**





DATE: March 25, 2008

TO: K. Pill

FROM: E. Glowiak

SUBJECT: Trip Report

**Site:** Moab – Interim Action Well Field Ground Water/Surface Water Interaction Investigation Sampling Event – March 2008

**Date of Sampling Event:** March 18-20, 2008

**Team Members:** Steve Back, Elizabeth Glowiak, Ken Pill

**RIN Number Assigned:** All samples were assigned to RIN 0803010

**Sample Shipment:** All samples were shipped in a cooler overnight UPS to Paragon Analytics, Inc. from Moab, Utah, on March 20 (Tracking No. 1Z5W1Y510196838735).

**Purpose:** The purpose of this investigation is to determine the extent of infiltration of bank storage inland on the Colorado River adjacent to the Moab UMTRA Site during high river flows. Migration of river water in land could potentially dilute the ground water contaminants during high river stage. If this is the case, evaporation pond capacity could be saved by reducing pumping during periods of high river stage. A series of surface water locations, well points, extraction wells, and observation wells from Configuration 1 and the Baseline areas were sampled at varying depths and distances from the river channel.

### March 2008 Configuration 1 Sampling

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**Number of Locations Sampled:** One extraction well (0474), 11 observation wells (0403, 0407, 0480, 0482, 0483, 0485, 0557, 0558, 0559, 0560, and 0561), three well points (0562, 0563, and 0606), one surface water location (0216) were sampled during the March 2008 sampling event. A total of 16 samples were collected.

**Locations Not Sampled:** None

**Field Variance:** None.

**Location Specific Information – Configuration 1 Extraction Wells:** Only one extraction well was sampled during this event using a dedicated submersible pump.

Well No.	Date	Time	Water Level (ft btoc)	Pump Intake (ft bgs)
0474	03/19/2008	11:18	13.02	18

**Location Specific Information – Observation Wells:** All observation wells were sampled using micro-purge techniques with a peristaltic pump and dedicated downhole and pump-head tubing. Sample depths and water levels for each observation well are listed below.

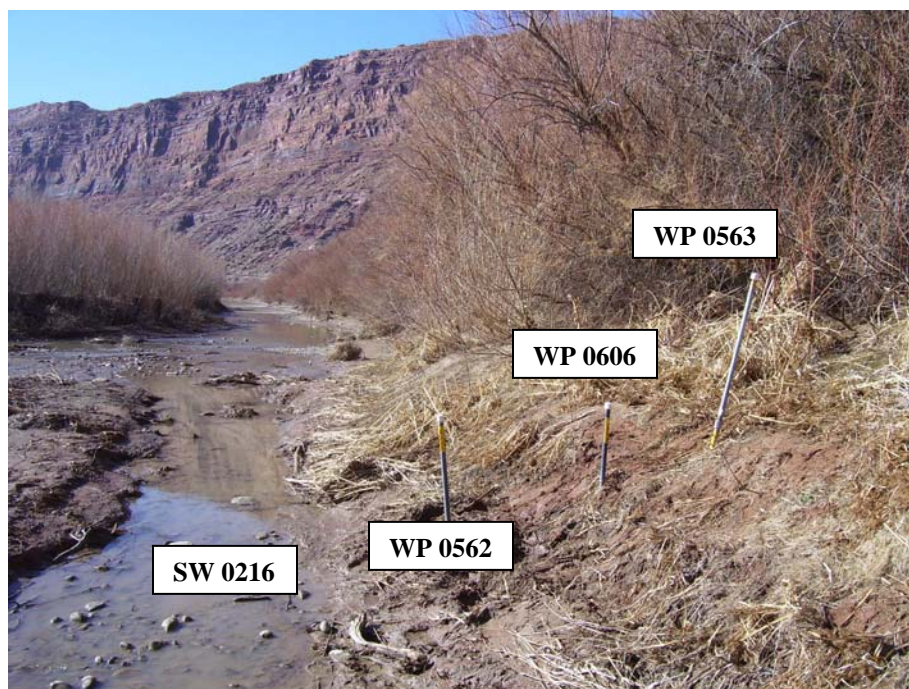
Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0403	03/18/2008	16:19	16.15	18
0407	03/18/2008	16:39	16.75	17
0480	03/18/2008	11:07	16.12	18
0482	03/18/2008	10:46	16.59	55
0483	03/18/2008	11:25	16.45	18
0485	03/18/2008	14:36	16.51	55
0557	03/18/2008	10:24	15.33	36
0558	03/18/2008	14:56	15.95	36
0559	03/18/2007	15:15	17.37	18
0560	03/18/2008	15:53	16.15	36
0561	03/18/2008	15:31	16.24	55

**Location-Specific Information – Well Point Sampling:** The table below presents the water level, stick up height, and depth to the river surface prior to the initial purge.

WP No.	Date	Time	Depth to Water (ft btoc)	Stick Up Height (ft)	Depth to River Surface (ft btoc)
0563	03/19/2008	09:16	5.66	2.87	Dry at base
0606	03/19/2008	09:36	3.05	1.58	Dry at base
0562	03/19/2008	09:47	3.20	2.00	Dry at base

**Location-Specific Information – Surface Water Sampling:** The table below represents the surface water locations sampled.

SW No.	Date	Time	Depth (in. below surface)	Characteristics
0216	03/19/2008	10:04	1-3"	Channel is approximately 4 ft wide and 1 to 3 in. deep, slow flow, barely connected up-river.



Configuration 1 river bank well points and surface water location 0216.

### March 2008 Baseline Area Sampling

**Number of Locations Sampled:** Six observation wells (SMI-PZ1M, SMI-PZ1S, SMI-PW01, 0405, 0488, and 0495), two well points (0495 and 0597), and one surface water location (0243) were sampled during the March 2008 sampling event. Including one duplicate, a total of 10 samples were collected.

**Locations Not Sampled:** The following locations were not sampled during the February 2008 sampling event.

Location No.	Type	Reason
0494	Well Point	Dry

**Field Variance:** None.

**Quality Control Sample Cross Reference:** Following are the false identifications assigned to the quality control samples:

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
2490	0488	Duplicate from 36 ft bgs	Ground Water	NFC 498

**Location Specific Information – Observation Wells:** All observation wells were sampled using micro-purge techniques with a peristaltic pump and dedicated pump-head and downhole tubing. Sample depths and water levels for each observation well are listed below.

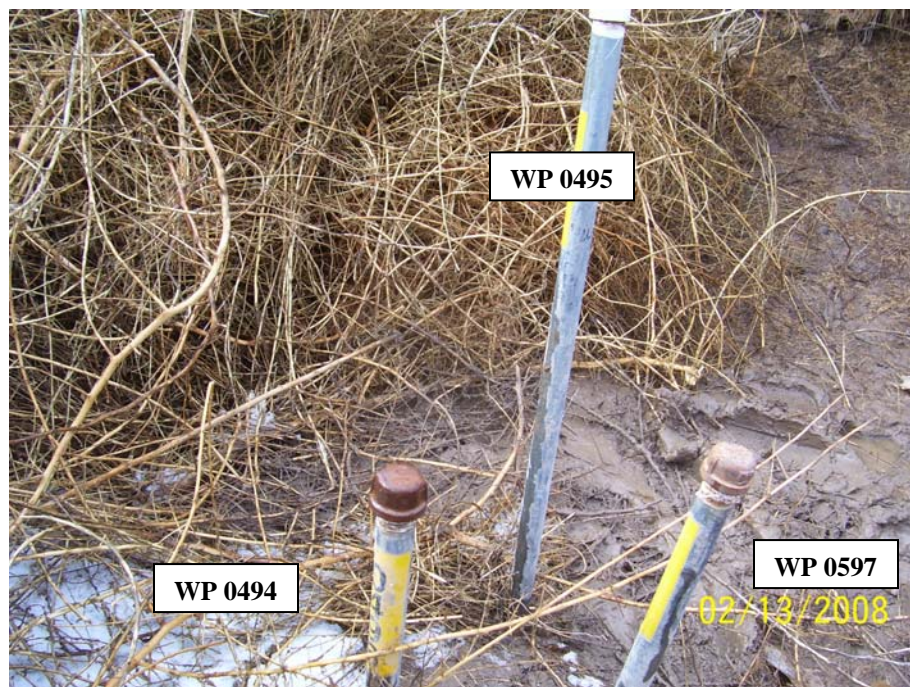
Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
SMI-PZ1M	03/20/2008	08:53	13.75	55
SMI-PZ1S	03/20/2008	08:33	14.59	18
SMI-PW01	03/20/2008	09:16	13.82	36
0405	03/19/2008	16:00	14.13	18
0488	03/19/2008	16:25	13.97	36
0493	03/19/2008	15:37	13.55	55

**Location-Specific Information – Well Point Sampling:** The table below presents the water level, stick up height, and depth to the river surface prior to the initial purge.

WP No.	Date	Time	Depth to Water (ft btoc)	Stick Up Height (ft)	Depth to River Surface (ft btoc)
0494	03/19/2008	13:52	Dry	1.40	Dry at base
0495	03/19/2008	13:56	5.56	2.30	Dry at base
0597	03/19/2008	14:00	4.76	1.55	Dry at base

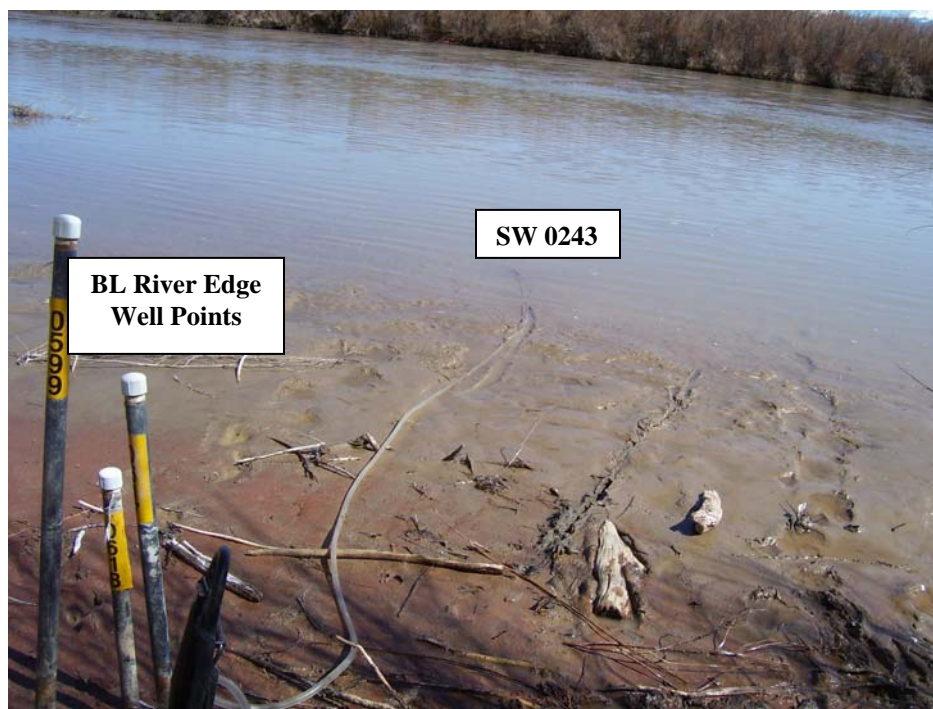
**Location-Specific Information – Surface Water Sampling:** The table below represents the surface water locations sampled.

SW No.	Date	Time	Depth (in. below surface)	Characteristics
0243	03/19/2007	14:18	~3	Collected off main river channel, very low water level, slow flow



Baseline river bank well points.





Surface water location 0243.

**Well Inspection Summary:** A well inspection was not conducted.

**Site Issues:** According to the USGS Cisco Gaging Station (Station No. 09180500), the mean daily Colorado River flows during this sampling event are provided below:

Date	Daily Mean Flow (cfs)
03/18/2008	3,610
03/19/2008	3,430
03/20/2008	3,160

**Equipment Issues:** None.

**Corrective Action Required/Taken:** None.

cc: J.D. Ritchey, P2S  
K. G. Pill, P2S  
E. M. Glowiak, P2S  
M. Mullis, S&K

## Appendix 1

### Acronyms and Abbreviations

AWQC	Ambient Water Quality Criteria
bgs	Below Ground Surface
BLS	Below Land Surface
btoc	Below Top of Casing
cfs	Cubic Feet per Second
CCV	Continuing Calibration Verification
COC	Chain of Custody
CRI	Reporting Limit Verification
DI	Deionized
D.O.	Dissolved Oxygen
EDD	Electronic Data Deliverable
EPA	Environment Protection Agency
ft	Feet
ICS	Interference Check Sample
ICP	Inductively Coupled Plasma
ICV	Initial Calibration Verification
IDL	Instrument Detection Limit
LCS	Laboratory Control Samples
MDL	method Detection Limit
mg/L	Milligram per Liter
mL/m	Milliliter per Minute
MS	Matrix Spike
MSD	Matrix Spike Duplicate
µmhos/cm	Micro Mhos per Centimeter
µS/cm	Micro Siemens per Centimeter
mV	Millivolt
NTU	Nephelometric Turbidity Unit
ORP	Oxidation Reduction Potential
PQL	Practical Quantitation Limit
RDL	Required Detection Limit
RIN	Report Identification Number
RPD	Relative Percent Difference
RS	Replicate Sample
SDG	Sample Data Group
Spec Cond	Special Conditions
SU	Standard Unit
TDS	Total Dissolved Solids
Turb.	Turbidity
UMTRA	Uranium Mill Tailings Remedial Action
USGS	U.S. Geological Survey
VDP	Validation Data Package